Just for your
TRS-80® COLOR
TDP System 100
Dragon & MC-10

June 1984

Canada $4.95 U.K. £3.35 $3.95

# The RAINBOW®

THE COLOR COMPUTER MONTHLY MAGAZINE

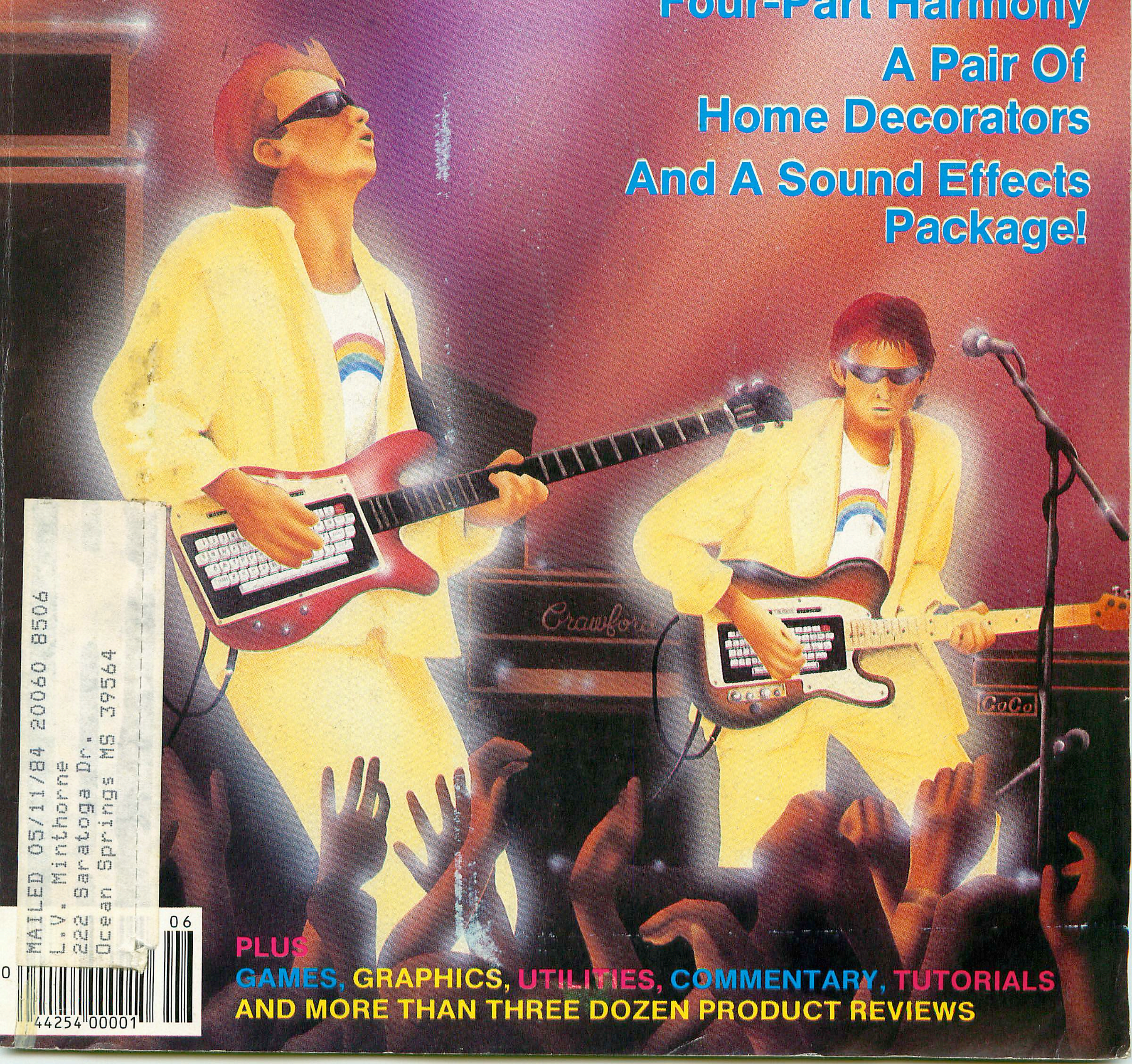
## MUSIC ISSUE

## COCO IN CONCERT

Composing In Four-Part Harmony

A Pair Of Home Decorators

And A Sound Effects Package!



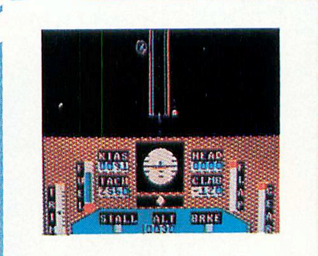
MAILED 05/11/84 20060 8506
L.V. Minthorne
222 Saratoga Dr.
Ocean Springs MS 39564

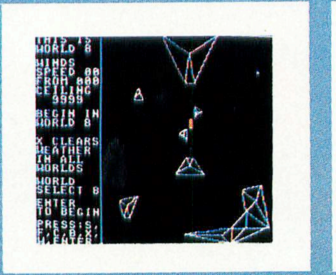
PLUS
GAMES, GRAPHICS, UTILITIES, COMMENTARY, TUTORIALS
AND MORE THAN THREE DOZEN PRODUCT REVIEWS

New From Tom Mix. . .

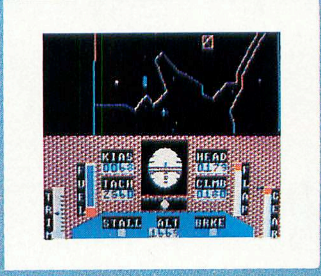
# Worlds of FLIGHT

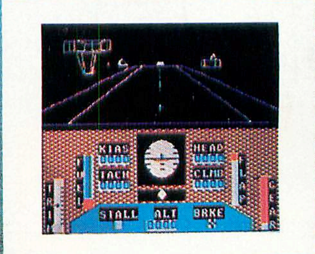
Not A Game — A Very Realistic Flight Simulation





```
THIS IS
WORLD 8

WINDS
SPEED 00
FROM 000
CEILING
  9999

BEGIN IN
WORLD 8

X CLEARS
WEATHER
IN ALL
WORLDS

WORLD
SELECT 8

ENTER
TO BEGIN

PRESS:S,
F,C,B,X,
W,ENTER
```





WORLDS OF FLIGHT (WOF) is a "view" oriented flight simulation for the TRS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.

**JOYSTICKS REQUIRED**

**32K MACHINE LANGUAGE**

**TAPE $29.95 DISK $32.95**

**The Experts Say:**

*C.L. — "As a pilot I found "Flight" to be an outstanding simulation.*

*M.H. — "No one has created a more realistic flight simulator for the Color Computer."*

*D. HOOPER, pilot for major airline — "An outstanding flying experience. Very realistic."*

**TOM MIX SOFTWARE**
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

**•ADD $1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•**
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE

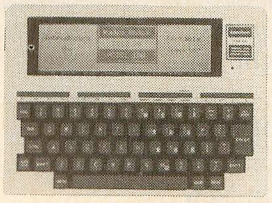
ARCADE ACTION GAMES

**TO ORDER CALL 616/957-0444**

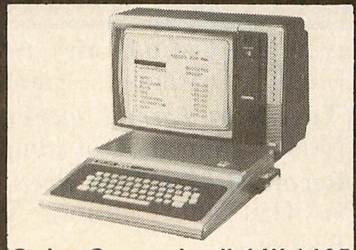
MasterCard VISA

## From Computer Plus to YOU . . .

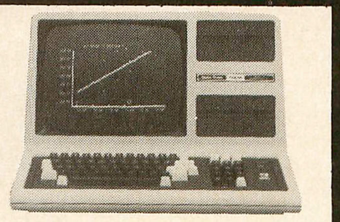
# PLUS after PLUS after PLUS



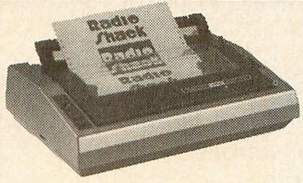
Model 100 8K $679
Model 100 24K $835



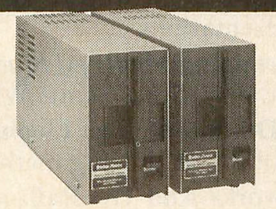
Color Computer II 16K $135
w/16K Ext. Basic $165
w/64K Ext. Basic $210



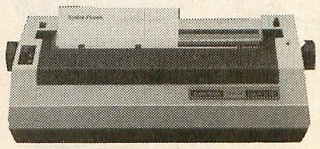
Model 4 16K $849
Model 4 64K
2 Disk & RS232 $1699



DMP120 $395
DMP200 $520



Color Computer Disk Drive
Drive 0 $329 Drive 1 $235



DWP210 $629

## BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

| **COMPUTERS** | |
|---|---|
| Model 4 Portable 64K w/2 Drives | 1525 |
| Model 2000 2Dr | 2299 |
| Model 12 1 Drive | 2360 |
| Model 16B 1Dr 256K | 3965 |

| **MODEMS** | |
|---|---|
| Hayes Smartmodem II | 225 |
| AC-3 | 129 |
| DC Modem I | 89 |
| DC Modem II | 160 |

| **PRINTERS** | |
|---|---|
| Silver Reed EXP500 D.W. Ser. | 455 |
| Silver Reed EXP550 D.W. Par. | 525 |
| CGP115 | 159 |
| CGP220 Ink Jet | 545 |
| DMP110 | 305 |
| DMP420 | 735 |
| Toshiba 1340 (24 wire head) | 779 |
| Gemini 10X | 289 |
| Gemini 15X | 409 |
| CITOH Prowriter | 359 |
| Okidata | CALL |
| Epson | CALL |

| **ETC.** | |
|---|---|
| Disk Drive Controller | 139 |
| Extended Basic Kit | 39.95 |
| PBH Ser/Par Conv. | 69 |
| 64K Ram Chips | 62.95 |
| Deluxe Keyboard | 35.95 |
| Superpro Keyboard | 69.95 |
| HJL Keyboard | 79.95 |
| CCR-81 Recorder | 52 |
| Deluxe Joystick (each) | 35.95 |
| Joysticks (pair) | 22 |
| Video Plus (monitor adapter) | 24.95 |
| Video Plus IIC | 39.95 |
| Amdek Color 1+ Monitor | 299 |
| BMC Color Monitor | 255 |
| BMC Green Monochrome Monitor | 99 |
| Taxan Green Mono. Monitor | 130 |
| Taxam Amber Mono. Monitor | 139 |

| **SOFTWARE** | (Tape Version) |
|---|---|
| Zaxxon | 34.95 |
| The King | 26.95 |
| Trap Fall | 27.95 |
| Buzzard Bait | 27.95 |
| Devil Assault | 27.95 |
| Colorpede | 29.95 |
| Juniors Revenge | 28.95 |
| Pac Attack | 24.95 |
| Block Head | 26.95 |
| Froggie | 24.95 |
| Lunar Rover Patrol | 24.95 |
| Lancer | 24.95 |
| Typing Tutor | 23.95 |
| Galagon | 24.95 |
| Scott Adams Adventures | 19.95 |
| Sea Dragon | 34.95 |
| Colorcome | 49.95 |
| Telewriter 64 | 49.95 |
| O-Pak (disk) | 34.95 |
| Key-264K | 39.95 |
| Elite-Calc | 59.95 |
| VIP Writer | 59.95 |
| VIP Calc | 59.95 |
| VIP Terminal | 49.95 |
| VIP Database (disk) | 59.95 |

Order any 2 software pieces listed and take 10% off their listed price. All Radio Shack software 10% off list. Send for complete list.

## CALL TOLL FREE
## 1-800-343-8124

- *LOWEST POSSIBLE PRICES*
- *BEST POSSIBLE WARRANTY*
- *KNOWLEDGEABLE SALES STAFF*
- *TIMELY DELIVERY*
- *SHOPPING CONVENIENCE*

VISA AMERICAN EXPRESS MasterCard

see us at RAINBOWfest CHICAGO

**computer plus**

P.O. Box 1094
480 King Street
Littleton, MA 01460

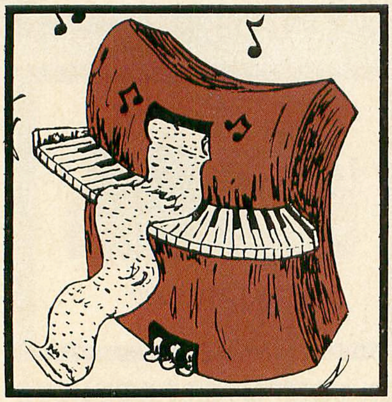
**SINCE 1973**

IN MASSACHUSETTS CALL (617) 486-3193

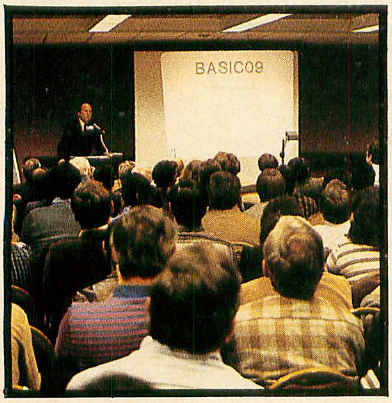
TRS-80 is a registered trademark of Tandy Corp.

# Under the Rainbow

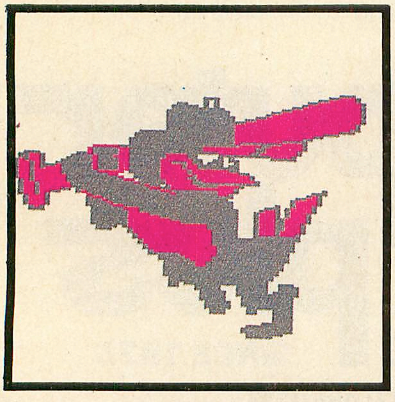
COVER art © by Fred Crawford



19



26



90

## FEATURE ARTICLES

**Playing The CoCo Ivories/** *Gordon Martens* .................... 19
Music Learning the piano — upright

**12 Tone Row/** *Larry Konecky* .................... 23
Music A method of composing worth noting

**A Record-Breaker/** *Jim Reed* .................... 26
RAINBOWfest Report Weekend in New Brunswick

**Move The Chair There And The Credenza Here/** *T.A. Fahlberg* ... 28
Home Utility A CoCo furniture re-arranger

**A Super Slide Projector/** *Donald D. Dollberg* .................... 53
Graphics Tutorial A visual aid to your presentations

**Entertaining Medleys/** *Brad Scoffin* .................... 57
Music Great Scott! Where's the clover?

**The Donkey Or The Elephant?/** *Howard Lee Ball* .................... 65
Utility A tallying method for the elections

**Fireworks And The Railroad/** *Sheila Elliot* .................... 67
Music Some grand overtures

**CoCo Quartet/** *Bob Ludlum* .................... 74
Music A plus to your music making

**Doodling All The Day/** *Eugene Vasconi* .................... 89
Graphics Becoming a CoCo Picasso

**Ah, The Classics/** *Gail Pollock* .................... 131
Music Getting a 'Handel' on 'Bach'

**What's In The Word?/** *H. Allen Curtis* .................... 138
Game Forming the word connection

**Four In A Row/** *Michael Popovich* .................... 156
Game Putting it in successful succession

**Sometimes It's Fun To Fret/** *Chris Phillips* .................... 162
Music Augmenting your guitar chord knowledge

**The Computing Woman Finds Success/** *Susan P. Davis* .......... 174
Commentary A look at women in the CoCo

**Finishing Your Symphony/** *Robert Rogers* .................... 179
Music A 'sharp' chord finder

**Sound Off!/** *Joe Hayden* .................... 185
Programming Utility Some string music

**Counting Your Rolls/** *Dennis Derringer* .................... 206
Home Help Calculating your wallpaper work

## RAINBOWTECH

**Downloads/** *Dan Downard* .................... 276
Answers to your technical questions

**hogg_wash/** *Frank Hogg* .................... 278
A FLEXible choice

**Design And Development Of Application Software — Part III/** *Paul Searby* .................... 282
Creating a file for your program application

**KISSable OS-9/** *Dale L. Puckett* .................... 287
A technical potpourri

# DEPARTMENTS

**Advertiser Index** .......... 305
**Back Issue Information** .......... 115
**BASIC Training/***Joseph Kolar* .......... 58
Testing . . . testing . . . computer widow
**Bits And Bytes Of BASIC/***Richard White* .......... 38
A convention registration program
**Building June's RAINBOW/***Jim Reed* .......... 16
A many-hued preview to this month's issue
**CoCo Counsel/***Tom Nelson* .......... 114
Printing preliminaries
**CoCo Graphics/***Don Inman* .......... 48
BASIC wins round two over LOGO
**Corrections** .......... 207, 246
**The Dragon's Byte/***Bill Nolan* .......... 193
'Puff' goes the magic dragon
**Earth To Ed/***Ed Ellers* .......... 183
A trek into the technical world of RAINBOW's resident hacker
**Education Notes/***Steve Blyn* .......... 121
2, 4, 6, __ = a sequential lesson
**Education Overview/***Dr. Michael Plog* .......... 51
Computers in the classroom — the future
**Greetings From Uncle Bert/***Dale Peterson* .......... 123
Twists and bumps at the county fair
**Letters To RAINBOW/***Our Readers* .......... 6
**The Pipeline/***Staff* .......... 152
**PRINT #-2,/***Lawrence C. Falk* .......... 14
Editor's Notes
**RAINBOW Info** .......... 136
**Received And Certified** .......... 212
**Reviewing Reviews** .......... 210
**School Is In The Heart Of A Child/***Fran Saito, Bob Albrecht* .......... 198
Work and play — educational harmony
**Scoreboard** .......... 194
**Scoreboard Pointers** .......... 196
Game clues and questions
**Submitting Material To RAINBOW** .......... 205
**Subscription Information** .......... 226
**These Fine Stores** .......... 302
**Turn Of The Screw/***Tony DiStefano* .......... 128
CoCo phoneme home
**Wishing Well/***Fred Scerbo* .......... 90
Baseball fever — a wishful triple header

# PRODUCT REVIEWS

**Expanded Index on Page 209**

Assembler Math .......... 225
Bible Stories Adventure .......... 230
Business Manager .......... 242
C-III .......... 258
Disk Dump/Patch Utility .......... 272
Disktype .......... 247
Electronic Graph .......... 271
Espionage Island .......... 228
Estimate .......... 234
Fractions Tutor .......... 270
Fundfile* Enhanced .......... 232
Gemini-10X Printer .......... 265
Girdle The Enemy .......... 247
GRAFPLOT 1.1 .......... 220
Here Comes De Prez .......... 222
J-Cat Modem .......... 261
Keep Text II .......... 264
Kids' Choice And Early Letter Recognition .......... 240
Lunar Rover Patrol .......... 236
Memo Minder .......... 254
Micromon .......... 260
Morse Code Tutor/Teacher .......... 250
Music Box .......... 256
Option 4 Payroll .......... 248
PBH Interface .......... 244
Pie Chart .......... 263
Pretty Printer .......... 262
Pro-Color-File Enhanced .......... 233
Quiz All .......... 218
Random BASIC .......... 224
Repeat Key .......... 249
Shenanigans .......... 226
Slay The Nereis .......... 239
T.UTIL .......... 269
Talking Score-EZ .......... 225
Vector Addition .......... 238

**NEXT MONTH:** Can it really be? Yes, it's our third anniversary issue — the beginning of our fourth year! We'll have a complete index of our first three years, referenced both by subject and by author. We'll have the most comprehensive program you could imagine for organizing disk files. We'll begin a new column on PASCAL and a new series on direct access disk files. We'll launch our second annual simulation writing contest. And, we'll have anniversary games and hoopla, including our absolutely off-the-wall surprise!

Plus dozens of other articles, features and hardware and software reviews — more information on the CoCo than is available anywhere else!

The RAINBOW

June 1984 Vol. III No. 11

**Editor and Publisher**
Lawrence C. Falk

**Managing Editor** James E. Reed
**Senior Editor** Courtney Noe
**Technical Editor** Dan Downard
**Copy Editor** Susan Remini
**Submissions Editor** Jutta Kapfhammer
**Editorial Assistants** Valarie Edwards, Wendy Falk, Suzanne Kurowsky, Lynn Miller, Shirley Morgan, Noreen Morrison, Kevin Nickols
**Technical Assistant** Ed Ellers
**Contributing Editors** Bob Albrecht, Steve Blyn, Tony DiStefano, Frank Hogg, Don Inman, Joseph Kolar, Bill Nolan, Dale Peterson, Michael Plog, Dale Puckett, Fran Saito, Paul Searby, Fred Scerbo, Richard White
**Art Director** Sally Nichols
**Assistant Art Director** Jerry McKiernan
**Designers** Peggy Henry, Neal C. Lauron
**Advertising Manager** Charlotte Ford
**Advertising Assistant** Debbie Baxter
(502) 228-4492
**General Manager** Patricia H. Hirsch
**Asst. General Manager for Finance** Donna Shuck
**Bookkeeper** Diane Moore
**Advertising Accounts** Doris Taylor
**Dealer Accounts** Judy Quashnock
**Administrative Assistant to the Publisher** Marianne Booth
**RAINBOWfest Site Management** Willo Falk
**Director of Fulfillment Services** Bonnie Shepard
**Asst. Customer Service Manager** Deidra Henry
**Customer Service Representative** Sandy Apple
**Word Processor Manager** Lynda Wilson
**RAINBOW ON TAPE Subscriptions** Monica Wheat
**Research Assistants** Laurie Falk, Wanda Perry, Loretta Varda, Kara Voit
**Dispatch** Mark Herndon
**Production Assistant** Melba Smith

**Advertising and Marketing Office for the Western states and provinces: Cindy Shackleford, director, 12110 Meridian South, Suite 8, P.O. Box 73-578, Puyallup, WA 98373-0578. Phone: (206) 848-7766. Territories included: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY, Canadian Provinces of Alberta, British Columbia, Saskatchewan.**

**THE RAINBOW is represented in the Eastern United States by Garland Associates, Inc., P.O. Box 314, S.H.S., Duxbury, MA 02331, (617) 934-6464 or 934-6546. Advertisers east of the Mississippi may contact them for further information. Territories included: AL, CT, DE, DC, FL, GA, IL, IN, KY, ME, MD, MA, MI, MS, NC, NH, NJ, NY, OH, PA, RI, SC, TN, VA, VT, WV, WI, Canadian Provinces of Ontario, Quebec.**

**THE RAINBOW** is published every month of the year by FALSOFT, Inc., 9529 U.S. Highway 42, P.O. Box 209, Prospect, KY, 40059. Phone (502) 228-4492. **THE RAINBOW** and **THE RAINBOW** logotypes are ® trademarks of FALSOFT, Inc.

Second class postage paid Prospect, KY and additional offices. USPS N. 705-050 (ISSN No. 0746-4797). POSTMASTER: Send address changes to **THE RAINBOW**, P.O. Box 209, Prospect, KY 40059. Forwarding Postage Guaranteed. Authorized as second class postage paid from Hamilton, Ontario by Canada Post, Ottawa, Ontario, Canada.

Entire contents © by FALSOFT, Inc., 1984. **THE RAINBOW** is intended for the private use and pleasure of its subscribers and purchasers and reproduction by any means is prohibited. Use of information herein is for the single end use of purchasers and any other use is expressly prohibited. All programs herein are distributed in an "as is" basis, without warranty of any kind whatsoever.

TRS-80, Color BASIC, Extended Color BASIC, Scripsit and Program Pak are ® trademarks of the Tandy Corp. CompuServe is a ® trademark of CompuServe Inc.

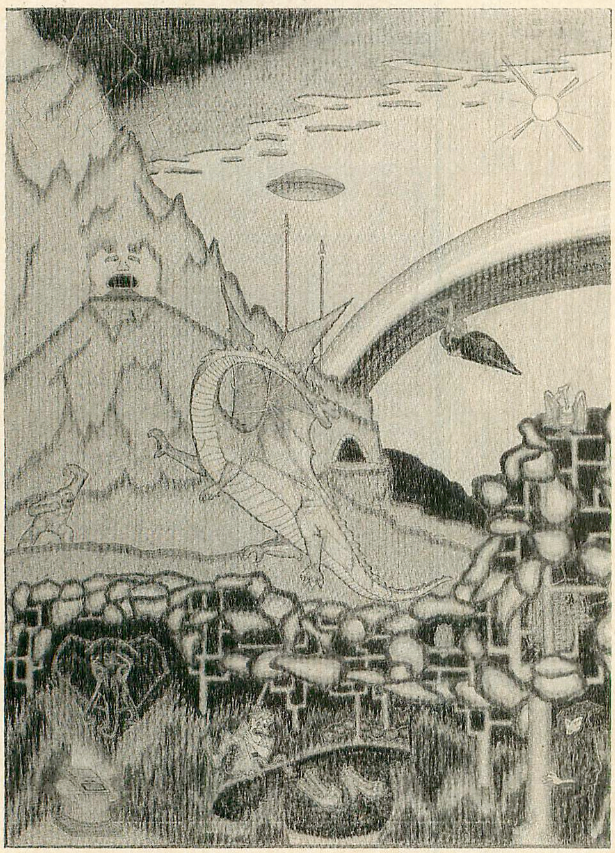
Subscriptions to **THE RAINBOW** are $28 per year in the United States. Canadian and Mexican rates are U.S. $35. Surface mail to other countries is U.S. $65, air mail U.S. $100. All subscriptions begin with next available issue.

Limited back issues are available. Please see notice for issues which are in print and costs. Payment accepted by VISA, MasterCard, American Express, Cash, Check or Money Order in U.S. currency only.

# letters to RAINBOW

## ARTS AND LETTERS

### Envelope Of The Month



*Michael Fulmer*
*Dublin, OH*

**Editor's Note: "Envelope" (poster) dimensions are 24 x 33 inches. We appreciate your time and talent! (It now decorates a wall of THE RAINBOW editorial office. Thanks again.)**

## NEEDED MOOD ELEVATOR

*Editor:*

You might want to add this story to your RAINBOWfest, New Brunswick scrapbook.

As I left the exhibit area Sunday and was waiting for the elevator, a very distraught woman approached. She spoke to anyone listening, "I am very upset. This was not what I expected it to be!"

Since I was closest, I asked what she had expected. She replied, "I thought this was on the DEC Rainbow computer." It seems her boss had heard of RAINBOWfest and thought she should attend. She was still muttering as she left the elevator.

I guess you can't win them all.

*Norman Barson*
*East Brunswick, NJ*

## KUDOS

*Editor:*

Just got back from the RAINBOWfest in New Brunswick. 1*10^38 Kudos for you guys. In my seven years of computing this was the best three days I've ever had.

Again, thanks to everyone. I know that I will be there in Princeton come September.

*Mark E.Sunderlin*
*Winchester, VA*

*Editor:*

You've got a terrific magazine. I think the best on the market. It's not only helpful but entertaining too!

*Dennis Sheehan*
*Newport, VA*

## MEGABYTES OF PRAISE

*Editor:*

As I was ordering RAINBOW ON TAPE, I felt compelled to write a short note to thank THE RAINBOW staff for being the source of the single-most piece of software that we CoCo owners can invest in. You probably get mega bytes of praise every month from your readers, but every "bit" is deserved. There's a pot of gold from one end of THE RAINBOW to the other! Thank you.

*Thom Roache*
*Folsom, CA*

## RAVE REVIEWS

*Editor:*

I have been a CoCo owner about 11 months and have enjoyed it thanks to your fine magazine. Please keep it up. I look forward to each new issue.

The product reviews in your magazine have caused me to upgrade my 32K Extended BASIC machine with disks, two printers, fan, new keyboard and most recently the Gorilla and Video Plus. All because of good reviews in your magazine. The problem came yesterday when I tried to install the Video Plus. On my board the chip they wanted me to take out was covered by three resistors and it was a major solder job to take them out and then replace them. I could not use the Video Plus and sent it back.

Since I had the Gorilla, I went through old RAINBOWS and in the January 1984 issue found Richard Kottke's "Monitor Mod for your CoCo." It worked fairly well. However, to get a good picture I had to turn the internal CoCo pot to max position. Thank Richard Kotte for a job well done — he was a life saver. I hope he will let me know if he has found any modifications that even do a better job. I wonder if I still need any interface? I hope somone out there in Rainbowland will let me know.

Keep up the outstanding job.

*Leon G. Wigrizer*
*Jenkintown, PA*

## SECOND CLASS TAPES

*Editor:*

I feel that tape system users are treated as being second class by some software companies. They will protect the software they sell from being copied on tape systems (i.e., *Telewriter 64* and *Worksaver*) while giving instructions to disk system users on how to make disk copies. Is a tape system user more prone to copy programs for illegal use than disk system users?

This is not fair to tape system users and limits the way in which the programs can be used.

We are kept from:

1) Making backup copies in case the original is damaged.

2) Assembling utility programs together on a tape for more convenient use.

3) Merging with other programs to make them easier to use.

I do not feel I should have to purchase a protection breaking program to get the full use of something I paid for. This makes me reluctant to purchase additional software if it is protected, especially for tape systems only. Software manufacturers should advertise if a program is protected and for which systems.

*Paul W. Gover*
*Plover, WI*

### HINTS AND TIPS

*Editor:*

My friends and I enjoyed Stephen Lai's "Puzzle Sticks and Picture Maker" program from Jan. 1984, Page 184, RAINBOW but could not trade the pictures that we created ourselves with the *PICMAKER* program without having to redraw them.

The following procedure will allow copying of your own puzzle creations. Clear your memory. *CLOADM "name"* of the picture which you wish to copy. Place the new tape in your recorder. *CSAVEM "name",1536, 7679,0.*

Another hint: When using *AUDIO ON: MOTOR ON* to find the end of a program on tape you do not have to type *AUDIO OFF:MOTOR OFF.* Just create a syntax error. This will turn the audio and motor off. Any key and ENTER will do it.

*Jim Hillhouse*
*Live Oak, FL*

*Editor:*

The pens on the Radio Shack graphics printer CGP-115 tend to dry out if not used every day or two.

I plugged mine into a power strip with my computer.

When turned on every day, the printer will perform its start-up sequence which is enough to keep the pens flowing — even when the printer is not used for several days.

*Kathy Roller*
*Romeo, MI*

*Editor:*

Sometimes it takes a 15-year-old.

We run FLEX on a 40- and an 80-track drive and, of course, Disk BASIC can make nothing of the 80-track drive. No attempt to format or read a disk succeeds, etc.

My older boy came up with the solution: boot OS-9 and type *FORMAT /D1* (this assumes you have not modified the distribution version of *CCDISK).* Then go back to Disk BASIC. The RS and RS-OS-9 disk formats are identical.

Of course, you have only 35 tracks, and you have to be careful about which disk goes where, but it beats having the drive sit around as an expensive paperweight.

*R.W. Odlin*
*Sedro-Woolley, WA*

*Editor:*

I have really enjoyed the fantastic array of programs and tips listed in THE RAINBOW magazine as well as those advertised there. However, I haven't seen any information about available golf handicap programs.

I have found that Radio Shack's *Spectaculator* spreadsheet can be used for computing an individual golf handicap exactly the same as the State Golf Association requires. I do this for my own. I have also been using a BASIC program that I wrote to compute golf handicaps for a two-person team league for the last two years. It has been a big help. Anyone with questions on above methods can write to me at 1111 Terra Way, 95678.

*Don Hug*
*Roseville, CA*

### FRIENDLY FLEXES

*Editor:*

I was beginning to wonder if anyone was going to say anything about the superiority of FLEX over OS-9 for the CoCo. Frank Hogg was right on target in his comparison, and I hope that CoCo owners in search of a DOS will heed his advice. I stuck with Disk BASIC until I wanted to start using compiled languages, and after considerable research, selected FHL Color FLEX. The convenience of the supplied utilities (and those in the public domain) make file management a treat. I regret that so many other CoCo users who are interested in trying another DOS are going to be discouraged by the OS-9 morass instead of moving forward with friendly FLEX.

*Lane P. Lester*
*Lynchburg, VA*

### PUTTING ON THE BRAKES

*Editor:*

When using the *STOP* command to debug your program, as for the information you want before you request the *stop* action. For instance:

```
10 INPUT"NUMBER ";A
20 IF A=3 THEN Y=10:X=30
30 IF A=4 THEN Y=20:X=40
40 PRINT X;Y:STOP
```

Line 40 shows the format that I use. It saves typing in the print request after the *STOP* command functions. A little thing but it has saved me many finger strokes.

I submit this in order to repay the help and enjoyment that your fine magazine has afforded me as I try to learn about my CoCo.

*George B. Sullivan*
*New Carrollton, MD*

### NO BOMBED DISKETTES

*Editor:*

I would like to pass along a hint for the magazine. Like all disk users, I have had my share of bombed diskettes. Before I panic, I always clean the controller contacts lightly with a soft eraser. This saves 95 percent of my I/O bombs. Rarely do I have to remove the cable from the controller.

*Richard D. Naw, Jr.*
*Rock Hill, SC*

### INFORMATION PLEASE

*Editor:*

I am interested in computerized music. I have a KORG Poly-61 Synthesizer and a Color Computer. I would like to use the computer to store my compositions and sounds (straight from the synthesizer). I also want to use the computer as a sequencer. I know that other computers can be interfaced with other synthesizers, but I don't know if the Poly-61 can be interfaced with the Color Computer. Will someone please tell me if it's possible? And will someone tell me how? If anyone can, my address is 3410 Oakcreek Drive, 95677.

*Jon C. Peterson*
*Rocklin, CA*

*Editor:*

I would like to buy a monitor for my CoCo and would like to know if there are any interfaces which do not need me to open my 64K CoCo. I really do not feel like opening my case up. Do you know of any?

You have an excellent magazine. Keep up the good work.

*Paul Gani*
*Marshfield, WI*

**Editor's Note: We know of no monitors that do not require you to open the case. At the same time most video adapters are solderless.**

*Editor:*

I am looking for a good Color Computer basketball statistics software package, suitable for keeping high school basketball statistics. I have seen advertisements for such a package, but a review of my back issues of RAINBOW have failed to find what I am looking for.

*R.E. Neily, Jr.*
*Dunedin, FL*

**Editor's Note: See "Net Results" by RichardWhite, Feb. 1984, Page 140.**

*Editor:*

I am looking for a program that will allow me to put all of my recipes on tape. I'm using a 32K ECB with cassette. Also I would like to be able to print selected recipes on my LP VII printer.

Thanks for any help you can give me. Your magazine is great.

*M.E. Mundy*
*Chula Vista, CA*

**Editor's Note: Computerware has a "CoCo Cookbook" program. See May 1984, Page 240 for their advertisment.**

### THE QUIET ZONE

*Editor:*

Here's a bit of a problem for your "hackers." I have an Extended Color BASIC unit ("E" board upgraded to 32K), Radio Shack Disk Drive "0," an Epson MX-100 printer, and a Radio Shack CCR-81 tape recorder system. Everything works just fine and dandy and there appears to be no electrical interference between any of the units (even though everything is sitting on a regular-sized card table).

My problem is that I get a terrific amount of "video noise" on my display TV screen (a 9" portable black and white set). Some of it, I admit, comes through the Radio Shack TV-Computer switch that comes with CoCo, and can be temporarily eliminated by simply passing my hand near that switch (located at the back of the TV set). That's only a minor nuisance. The real bear is the noise I am getting from the computer itself, and which sometimes can be eliminated by placing my hand on top of the computer itself (usually nearer the left side air vent hole works best). This stops the noise for just a bit, but as soon as I start using the keyboard or joysticks, the noise comes back.

I know someone out there is going to say "you've got something loose behind the gizzmowhichit" (my wife says there's a loose nut above the keyboard . . .), but if there is anything loose inside, I'll be darned if I can find it! Any ideas?

*Jerald R. Thompson*
*Brigham City, UT*

**Editor's Note: One solution would be to use a monitor instead of a TV. Depending on your particular TV and other variables a certain amount of noise (RF) will always be present. The only thing you can do is try to minimize it by several methods as described by Tony DiStefano, April 1983, Page 146 in THE RAINBOW.**

*Editor:*

Since I have had disk drives there is a lot of interference on the screen. However, when I remove the controller there is a great clear picture. What can be done to fix this? I have tried grounding the electrical wires and changed the cable to a coaxial cable.

*Lenny Munitz*
*Bellerose, NY*

**Editor's Note: The cable from the controller to the disk drive is causing your problem. Try consulting your local Radio Shack dealer to insure that the grounding connections are okay.**

### A BIGGER BYTE'LL DO YA

*Editor:*

I need a little help. I have a 16K Non-Extended BASIC Color Computer with cassette. I was writing a program in assembly language using Radio Shack's *EDTASM+*. It's a program that allows me to edit my BASIC programs. It also spells out errors (?Syntax Error In "XXX"). When I saw "Keyboard Shorthand" in the February issue, Page 188, I wanted to add this program to my program. I loaded in the text file for my program, renumbered it, and started to type in "Keyboard Shorthand." Before long, I got a "Buffer Full" Error. I got around that by removing a few remarks from here and there. Then came my main problem. I got a Symbol Table Overflow Error. My question is, how do I get around this one. Would upgrading to 32K help any?

*Harry L. Perkins, III*
*Norfolk, VA*

**Editor's Note: Upgrading to 64K is easier and will solve your problem.**

*Editor:*

I had some problems with Ray Gauvreau's program allowing 40K RAM (January 1984). As stated, I get 39207 of free memory after a *PCLEAR0*. I was glad to get another 8K of memory to expand my string storage with two RAINBOW gems that I use regularly: *Universal Datafile* by Jorge Mir, June 1982, and *Color Accountant* by Mike Himowitz, February 1983. With both programs, I got an FM Error when I tried to load my old tape files. I tried a new test file, but I still got an FM Error on loading. Can you help me to solve this problem?

Thank you for your fine magazine. It's a real pot of gold.

*Marc Coulombe*
*Grand-Mere, Quebec*

**Editor's Note: Marc, see following letter.**

*Editor:*

For anyone using the 40K program ("A Bigger Byte for BASIC," January 1984) and trying to read in cassette files, I have a solution. For some reason a memory location in the basic input routine is modified when the 40K program is executed. This is not done directly by my routine and I have not been able to trace down the area in BASIC or Extended BASIC that is causing the problem. Once you have executed the program simply *POKE 41984,74* to correct the BASIC input

EARLY GAMES
FOR YOUNG CHILDREN
NINE LEARNING GAMES
BY JOHN PAULSON
CSI counterpoint software inc.

The Best Selling Program for Young Children
Now Available for: TRS-80 Color Computer-
16K disk or cassette and TRS-80 Models
I/III-32K disk or 16K cassette

Nine fun educational games for children ages 2½ to 6

**counterpoint software, inc.**
4005 West Sixty-Fifth Street
Minneapolis, Minnesota 55435

Phone Orders: 800-328-1223
Minnesota: 612-926-7888

Educators Endorse: "Early Games can help children learn new concepts, information and skills, and also introduces them to the joys and benefits of home computers."

Peter Clark, Faculty
Institute of Child Development
University of Minnesota

No adult supervision required. The Picture Menu gives children control. They can:

- Match Numbers
- Count Colorful Blocks
- Add Stacks of Blocks
- Subtract Stacks of Blocks
- Draw and Save Colorful Pictures
- Match Letters
- Learn the Alphabet
- Spell their Names
- Compare Shapes

All nine games for $29.95

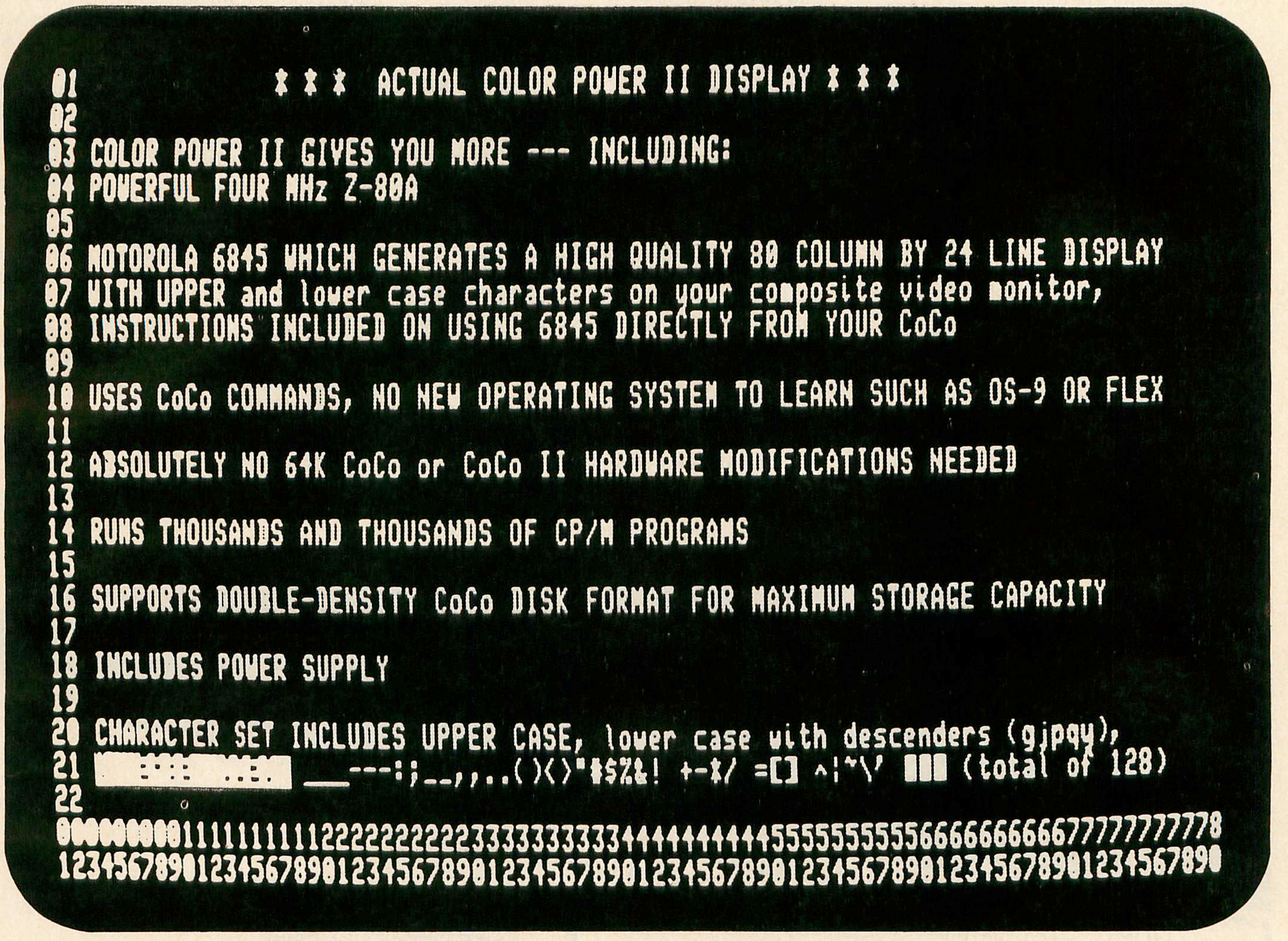
Yes! *Please rush me Early Games for Young Children*

Circle one:
Model I Disk  Color Computer Disk  Model I/III Cassette
Model III Disk  Color Computer Cassette

Name
Address
City  State  Zip
☐ My check for $29.95 is enclosed (Minnesota residents add 6% sales tax).
☐ Charge to VISA  ☐ Charge to Mastercard
Acct. No.  Expiration Date

# Color Power II

## Expands Your CoCo to CP/M



```
01           * * *  ACTUAL COLOR POWER II DISPLAY * * *
02
03 COLOR POWER II GIVES YOU MORE --- INCLUDING:
04 POWERFUL FOUR MHz Z-80A
05
06 MOTOROLA 6845 WHICH GENERATES A HIGH QUALITY 80 COLUMN BY 24 LINE DISPLAY
07 WITH UPPER and lower case characters on your composite video monitor,
08 INSTRUCTIONS INCLUDED ON USING 6845 DIRECTLY FROM YOUR CoCo
09
10 USES CoCo COMMANDS, NO NEW OPERATING SYSTEM TO LEARN SUCH AS OS-9 OR FLEX
11
12 ABSOLUTELY NO 64K CoCo or CoCo II HARDWARE MODIFICATIONS NEEDED
13
14 RUNS THOUSANDS AND THOUSANDS OF CP/M PROGRAMS
15
16 SUPPORTS DOUBLE-DENSITY CoCo DISK FORMAT FOR MAXIMUM STORAGE CAPACITY
17
18 INCLUDES POWER SUPPLY
19
20 CHARACTER SET INCLUDES UPPER CASE, lower case with descenders (gjpqy),
21 █████████ ___---:;__,,..()<>"#$%&! +-*/ =[] ^¦~\' ███ (total of 128)
22
00000000011111111112222222222333333333344444444445555555555666666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Plug Color Power II into the expansion port of your 64K CoCo or CoCo 2, plug your disk controller into Color Power II, and insert our disk into your drive. You are now ready to run thousands of CP/M programs such as WordStar®, MailMerge®, SpellStar,™ and StarIndex.™ It's that simple!

You now have have a fully professional CP/M compatible computer that generates an 80 column by 24 line display on your 80 column monitor with upper and lower case characters and works with your CoCo commands.

### Introductory Prices:

| | |
|---|---|
| Color Power II | $299.00 |
| Color Power II plus WordStar® & MailMerge® | $469.00 |
| Add SpellStar™ and StarIndex™ for only | $ 79.00 |

Call or send check, money order, Visa or MasterCard number with expiration date to the address below.
N.J. residents add 6% sales tax.

**Color Power Unlimited, Inc.**
1260 Springfield Ave., P.O. Box 606-D, New Providence, N.J. 07974 **(201) 665-9646**

---

CP/M is a trademark of Digital Research, Inc., WordStar, MailMerge, SpellStar, and StarIndex are trademarks of MicroPro International Corp.

routine. File input and output will now function normally. This pole can be added to the beginning of your file programs.

*Ray Gauvreau*
*Sault Ste. Marie, Ontario*

*Editor:*

I am trying to decide on which voice synthesizer to buy. Could you please tell me if you have reviewed Spectrum Projects' *Voice Pak* or Colorware's *Real Talker*. I have a disk system so I would need one that was disk compatible. Thank you.

*Mark Famous*
*Street, MD*

**Editor's Note: *Voice Pak* was reviewed in the November 1983, Page 278 issue of THE RAINBOW and *Real Talker* will be reviewed in next month's issue.**

### BOUQUETS & BRICKBATS

*Editor:*

There are few firms in Canada offering their own brand of software for CoCo users north of the border. Among these I rate *Dataman* of Hamilton, Ontario most highly. They not only manufacture software for Canadian conditions (I don't refer to the freezing cold here), but are also prepared to back it up with prompt service and advice.

Their *Datamail* program is the very best I have used for mailing lists and it is a real steal at the price it is being offered. As regards your own magazine, RAINBOW is the definitive vehicle for all that is interesting and new for CoCo fans.

*B.N. Thadani*
*Winnipeg, Manitoba*

*Editor:*

I am writing to share some information with potential mail order patrons. I recently purchased a video monitor and Video Plus interface from Endicott Software, in Huntsville, Ala., who advertises in RAINBOW. Upon receipt of the shipment, I was dismayed to find the instructions for installation of the Video Plus virtually incomprehensible to me. (I admit to a pronounced weakness in the electronics field, though.) A call to Endicott resulted in a prompt response. Mr. Endicott provided me with explicit, step-by-step instructions for the installation, and, when it was determined that the interface was defective, a new one was forwarded immediately, with no questions asked.

I am pleased to commend Endicott's post-sale support. Some of my previous experiences with mail order have resulted in much less happy outcomes! I really feel that the company went above and beyond the call of duty in this case, and wish to express my gratitude publicly.

Incidentally, I often use my CoCo for word processing, and find that my current setup — 64K CoCo, disk drive, Gemini 10X printer, Amdek Video-300A Monitor, and *Telewriter 64* — allows me to process words on a par with my friends owning much more expensive computers, printers, and software.

Also, as long as I am writing, I want to express my appreciation for your publication and for RANBOW ON TAPE (and especially for the Color Computer itself).

*Barry Friedman*
*Hattiesburg, MS*

### BULLETIN BOARD SYSTEMS

*Editor:*

We have a Bulletin Board system in the Jackson area (Amador County). The phone number is (209) 223-3800. Hours are Monday through Friday 6 p.m. to 8:30 a.m., Saturday 3:30 p.m. to 8:30 a.m. Monday.

The system's name is Gold Country Bulletin Board. It has upload/download and electronic mail capabilities. We will try to answer any electronic or computer questions. It is sponsored by Sierra Pacific Sound, Radio Shack Dealer, P.O. Box 486, 95642.

*Dean Perano, SYSOP*
*Jackson, CA*

*Editor:*

Color-80 of Syracuse is a new CoCo Bulletin Board online 24 hours. We feature upload, download, news, sports, merchandise, E-Mail and more. We welcome all types of computers. The number is (315) 487-0503 (BBS).

*Kris Olmstead, SYSOP*
*Syracuse, NY*

**EVERYTHING**
You've Always Wanted To Know About
The **COLOR COMPUTER** . . .
But Didn't Know **WHERE** To Ask.

The COCOINDX is now available! Find the information you need FAST, in this 73 page spiral bound Reference Guide.

- All COCO articles indexed from Jan. 1981 thru March 1984
- System requirements shown
- Nineteen types listed
  Adventure
  Education
  Games
  Utility programs
  Hardware projects
  Editorials
  Ham Radio
  & more
- 1800+ listed: Cross indexed
  TYPE-DATE-MAGAZINE
  DATE-MAGAZINE-PAGE
- Basic and Machine language
- Data Base: PRO-COLOR-FILE
- Flex, OS-9 highlighted
- Data segments available soon
- Update to be available

$19.95
PLUS $1.00 SHIPPING

AZ RESIDENTS ADD 6% TAX
DEALER INQUIRIES WELCOME

COCOINDX
P.O. BOX 23654
TEMPE, AZ. 85282
(602) 839-5169
AFTER 5 PM MST

MasterCard VISA®

# Double Density Software

# COLOR TERM + PLUS +

If you're looking for the finest terminal software you can buy, look no further! And now we've added a **high-res screen** display that gives you 32 by 16, 42, 51, or 64 by 24 lines.* And you can switch between the high-res screen and the normal screen ***without*** destroying what you have in the buffer! + **PLUS** + we have a buffer editor, complete up and down load support, on-line cassette or disk reads and writes, off-line and on-line scrolling, pre-entry of data before calling, word wrap, buffer printing, selective printing, change **any** parameter so you can communicate with **any** other computer. You can send and receive Basic programs, ASCII file, as well as machine code, + **PLUS** + you can save your buffer to tape (Tape or Rom version) or disk (Disk version). You can communicate with the local **BBS, Compuserve™, The Source™,** the main frame at work or school, other color computers, Apples, IBM PC's, TRS-80 Model I, II, III, IV, 12, 16, 100, or any other computer via RS-232.

Compare these features with ***any*** other terminal program:

32 x 16, 42, 51, 64 x 24 Screen
Communications BAUD Rate: 110-19200
Printer Baud Rate: 600-9600
Select Half or Full Duplex.
Select Odd, Even, or No Parity.
Select 7 or 8 Bit Words.
Send Control Characters.
Send a True Line Break.
Separate Keys for Escape and Rubout.
Select All Caps If Needed.
Word Wrap — Eliminate Split Words.
  (32 Character Mode)
Selectable Reverse or Normal Video.
  (32 Character Mode)

**NOW WITH 42, 51 OR 64 CHARACTERS BY 24 LINES!**

see us at RAINBOWfest CHICAGO

Scroll Protect Up to 9 Lines.
Automatic Capture of Incoming Files, Send One Line At a Time From Your Buffer.
Has Programmable Prompt for "Send Next Line!!
Buffer Size Indicator.
Complete Up and Down Load Support.
Improved Buffer Editor.
On/Off Line Scrolling of Buffer.
On/Off Cassette or Disk Reads and Writes.
Pre-Enter Data Before Going On-Line.
Save/Load Machine Code, Basic Programs or Files.
Select Printer Line Feeds If Needed or Ignore All Line Feeds in Buffer.

*Disk and Rom Pack only (not on tape). PRICE: $29.95 (TAPE) $39.95 (ROM PACK) $39.95 (DISK)

## DOUBLE SPOOLER NEW

Tired of waiting for your listings? printouts? etc.? This is THE Spooling Program!! No need to save your programs in ASCII. You can also spool your files and you can spool **ANYTHING** you print on the screen while a program is running!! Requires a minimum of 32K **AND** the 64K computer can spool really **LARGE** files!! Plus more!!
PRICE: $19.95 (Tape) $21.95 (Disk)

## DOUBLE MEM-DISK NEW

Use that **32K** of unused memory in your **64K** computer for something useful! Store programs in memory and recall them anytime you need them!! Here is a list of the new commands you can enter right from the keyboard:

**MSAVE** — Save the program in memory.
**MLOAD** — Load a named program.
**MKILL** — Kill a program stored in memory.
**MDIR** — List all programs stored in memory.
**MFILE** — Merge a program in high mem with current program in low memory.

Those of you with tape systems will have several programs in memory at once so you don't have to wait on that **SLOW** tape system **AND** those of you with disk systems will be able to use that extra space that is going to waste!!
PRICE: $24.95 (Tape) $26.95 (Disk)

### DOUBLE CABLE

Tired of switching cables everytime you use your modem and printer? This is the fix!! Hook your modem and printer up at the same time! No more switching.
PRICE: $14.95

$2.00 shipping and handling on all orders. $3.00 charge on C.O.D. orders, Mastercard and VISA accepted. Texas residents add 5% sales tax. Allow two weeks for personal checks.

MasterCard

**Double Density Software**
920 Baldwin Street
Denton, Texas 76201
Phone 817/566-2004.

VISA

## DOUBLE SWITCH NEW

Now you can switch between two different devices **AND** you get an on/off indicator at the same time. Switch your **Modem** & **Printer** or two printers, etc.
PRICE: $29.95

## DOUBLE DOS BASIC NEW

### 364,000 BYTES!

That's right! Using your 64K Color Computer, and an 80 track drive, you too can have more than **TWICE** as much storage on your disk drive system. **DOUBLE DOS BASIC** allows you to use 35, 40 or 80 track (**double** or single sided) drives all on one system, all at the same time! Your system could consist of a 35 track drive, a two drive AMDEK system, and an 80 track drive, all working, and hooked up to your system! (The AMDEK drives are 40 track drives.) **ALL** commands are supported in **DOUBLE DOS BASIC.** The DOS is **totally** transparent to your BASIC programs! If your system selection is 80 tracks, a PRINT FREE command will return **158** granules! Compare this to the 68 granules your system now returns! The 40 track drives would return 78 granules, 10 more than the 35 track system. **EVERY** command in BASIC is supported by **DOUBLE DOS BASIC.** If you haven't already upgraded to 64K, now is the time! Use your system to its **FULLEST! DOUBLE DOS BASIC** also gives you RESET PROTECTION, unlike most of the other **64K** programs. **AND,** used with our ROM MOVE program, you can also get another 8000 bytes of BASIC addressable memory!
DOUBLE DOS BASIC — $24.95
DOUBLE DOS & ROM MOVE — $24.95

# Give up on Word Processors for Fast Letter Writing & Mailing Labels

**Instead use the new 64K**

# DATABASE/MAILER 64
# &
# LETTER WRITER 64

**BOTH FOR $5995**

plus shipping & handling

**for FAST single page letters or**

**1000's of personalized form letters and labels**

See excellent reviews of DBM/LW in "Rainbow" magazine 12/83 and "Things to do with your Color Computer," in paperback by Dilithium Press.

RAINBOW

**NONE BETTER –**
**for ALL Revision Boards!**
**FULLY compatible with COCO2!**
**THE MOST COMPLETE PACKAGE AVAILABLE!**

## *NO WORD PROCESSING EXPERIENCE NECESSARY*

ACCOUNTS • INSURANCE • PROPOSALS • BULK MAIL • DENTAL RECALL • CHRISTMAS LISTS • CHURCHES • CLUBS • REALTORS • SALES

### — BIG SYSTEM FEATURES —

***Won't "Hangup" your System***

- Active menus guide you to valid operations.
- 16K system allows 11 to 82 records per file.
- 32K system allows 66 to 440 records per file.
- 64K system allows 91 to 610 records per file.
- 4 – 10 fields, 5 – 27 field widths, 20 – 270 char/record.
- All user definable with default values – simple.
- Sort any field alpha/numeric, full or partial.
- Adjusts for empty address lines – no gaps.
- Up to 9 line labels with up to 500 copies each.
- Master two column printout with field names.
- Master printout includes date, paging & filename.
- Selective printing by any field or field range.
- Accepts alpha or numeric zip codes up to 10 digits.
- Partial or whole item search by any chosen field.
- Single screen 10 record display by any field.
- Single key entry for hard copy of screen data.

***Full Memory Sense***

- Fast single page letter writing with wordwrap.
- Embedded commands center, tab and line skip.
- Full screen edit allows delete, insert & change.
- Headings and closings are tabbed, spaced and printed – all automatically.
- No "Database Adventure" – over 40 page manual.
- Manual includes program operation flowcharts.
- Not needed, but included is user modification section.
- Access up to 4 drives in disk version.

### — FEATURES —

**FILE MANAGER 64**
A utility program custom designed for DATABASE/MAILER files only (16K, 32K, 64K, Tape or Disk)

- Create new files from all or part of old file.
- Auto select "special" records for saving to new file.
- Change lengths, add or delete fields of existing files.
- Auto copy identical data to all records in file.
- Combine unfilled files to create new file from old.
- Full memory sense adjusts to your system.

**NEW RELEASE!**
**$3995**

## We ship 1st Class Mail within 48 hours

**Call our 24 hour orderline**
**619-695-1385**

**or 619-566-6013, 9 — 5 p.m. PST weekdays**
**or send check or money order to:**

When ordering please provide:
NAME
ADDRESS
CITY/STATE
ZIP CODE
PHONE
TAPE or DISK
CREDIT CARD NO.
EXP. DATE
Master Card holders — include interbank no.

# EVS ENGINEERING

9528 Suite 35, Miramar Road
San Diego, CA 92126

*"Serving the Defense and Space Industry since 1979"*

Please include the following:
$3 postage and handling
U.S. funds only
CA residents add 6% tax
COD orders add $2
Amdek disk add $4

Dealer inquiries invited

Personal checks – OK
we won't make you wait.

MasterCard

VISA

*Editor:*

It is with great pleasure that we at the Midlands 80 Computer Club announce the implementation of the Midlands 80 TBBS Bulletin Board System.

We cater to all R/S computers but we have special sections for the Color Computer. We are online 24 hours a day and operate on both 300/1200 bps. Download section is in operation and we invite all of the CoCo community to join us. Our number is (803) 755-3414 and Steve Nagasaki is your SYSOP, with Ed Sehlhorst your CoCo store manager.

*Tommy R. Sanders*
*Columbia, SC*

*Editor:*

We have a bulletin board in Pomona, NY, called the Game Machine.

The Game Machine is a CP/M based board with seven different boards: CoCo; TRS-80; Apple; Atari; Commodore; IBM; and a general board for various information.

It is run on a TRS-80 Model II with three disk drives. I am going to be starting a Color Computer Club very soon that would be run through the board. In the near future we would support VIDTEX graphics. The number is (914) 362-1422.

*Seth Needleman*
*Pomona, NY*

*Editor:*

Color-80 of Syracuse is a new CoCo Bulletin Board online 24 hours. We feature upload, download, news, sports, merchandise, E-Mail and more. We welcome all types of computers. The number is (315) 487-0503 (BBS).

*Kris Olmstead, SYSOP*
*Syracuse, NY*

---

## CLUBS, CLUBS, CLUBS

*Editor:*

I would like to inform your readers of a club in the Salt Lake City, Utah area that is specializing in two computers — the CoCo and the Commodore 64. We are numbering about 22 CoCo and 18 C64 users and their families. Having a club with two different computers sure keeps things interesting, with one group constantly trying to outdo the other. The competition is high and the camaraderie is great.

If interested write: The Small Computer Users Assoc. of Utah, 3828 S. Bills Drive, 84120.

*Eldon Griffiths*
*West Valley City, UT*

*Editor:*

Attention to all the Orange County CoCo users! The Orange County chapter of Color America meets on the third Sunday of the month in the Hushinger Hall on Chapman College. Previously our 30 or so members have enjoyed the special interests groups and discussions on OS-9, CP/M, *GraphiCom,* and other interesting topics. So what is stopping you from coming by at 1 p.m. and joining us? If you need more information, contact Steve Secord at (714) 847-4256.

*Ken Coleman*
*Huntington Beach, CA*

*Editor:*

We would like to let your readers know that a TRS-80 Color Computer Users Club is now forming in the Winfield-Ark City, Kan., area. The Walnut Valley Color Computer Users Club meets every first Saturday of the month in the Christy Hall administration building (room 12) at Southwestern College at 7 p.m. We invite all CoCo users in this area to join us at our next meeting.

If you would like more information you can call me at (316) 221-0040. Or write to: 1212 E. 4th Street, 67156.

*David S. Anderson*
*Winfield, KS*

*Editor:*

The Greater Wilmington Color Computer Users Group meets on the third Tuesday of each month at 7 p.m. Anyone interested in participating may contact me at (919) 799-3886 or write to me at 814 Pine Forest Road, 28403.

*Les Hewlett*
*Wilmington, NC*

---

## UH, NEVER MIND

In the "Letters to Rainbow" section of our May 1984 issue, a reader from Windsor, Ohio, provided a short program to test your RAM chips. While it appeared to run satisfactorily in a brief check here at THE RAINBOW, we have since learned that, under certain, frequently occurring conditions, it will give a false report. At best the program provides only indirect and inconclusive evidence and, at worst, it can give the wrong information, depending on several variables. Thus, we advise that this listing be left for use of service center technicians. A full discussion of this will appear in our July "Earth To Ed" technical Q&A column.

---

## GAMES, GAMES, GAMES

*Editor:*

I am asking the help of anyone out there that has (graphic versions) the games *Black Sanctum, Shenanigans, Calixto Island,* or *Seaquest.* I'm getting desperate so if I could get the complete solution to the games I would be grateful. Send answers to: 9525 S.W. 1st Court, 33065.

*Mike Rothman*
*Coral Springs, FL*

**Editor's Note: Mike, look at our new "Scoreboard Pointers" column on Page 196. Hope some of the "hints" will be useful to you and others.**

# Six-Pack Ribbons

119 Village Square, Louisville, KY 40243 • 245-0064

## Order a SIX PACK of our best and SAVE!

| Item # | Ribbons for: | per SIX PACK |
|---|---|---|
| 5592 | Apple Dot Matrix | $30.90 |
| 5584 | Epson MX70/MX80 | 34.10 |
| 4487 | Epson MX100 | 48.60 |
| 5594 | Epson MX100 Zip Pack | 23.80 |
| 5549 | Okidata 80, 82, 92 & 93 | 12.40 |
| 6617 | Okidata 84 & 94 | 28.80 |
| 5592 | C. Itoh Prowriter | 30.90 |
| 7702 | Qume Sprint 3 & 5 | 14.10 |
| 7720 | Qume Sprint 7, 8, 9, 10 & 11 | 23.20 |
| 5588 | Radio Shack L P III, V | 36.80 |
| 7588 | Radio Shack L P VI, VIII | 32.40 |

Now you can order top quality ribbons in small quantities with bulk rate prices. Our ribbons are satisfaction guaranteed. If you're not satisfied with the performance of our product, return the unopened portion of your order for full credit.

*All orders are shipped promptly.*

**SIX PACK RIBBONS** has supplies available for more than 3,000 models of word/data processing equipment. For additional pricing information call or write us!

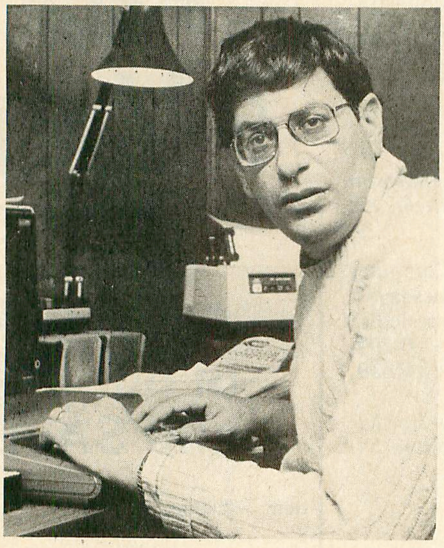
Credit Card, Check, or Money Order enclosed.

☐ MasterCard ☐ VISA ☐ American Express

**SIX PACK RIBBONS**
119 Village Square, Louisville, KY 40243
(502) 245-0064

Name ____________
Address ____________
City ____________
State ____________ Zip ____________
Card Holder Signature ____________
Card Holder Name (Please Print) ____________
Card Number ____________
Master Card Interbank No. ____________ Card Expires Mo./Yr. ____________

# PRINT #-2,



We're only one month away from THE RAINBOW's third anniversary and I want to tell you that it looks like it is really going to be a very special one!

I am not in the habit of telling you a lot about some of the things we have planned for any special issue, mainly because we want things to be a surprise when they happen. But, I think, we have a history of doing some things that are really surprising and innovative for these anniversary issues. This year's should be no exception!

For the first anniversary, we went "slick," with a four-color cover and typesetting for the very first time. That was really interesting, because we were renovating the basement of the house at the time to be an office for THE RAINBOW. The new typesetter was sitting in the middle of all the renovation work (and I was the only one who knew how to use it, anyway) and it had to be covered up all day to keep the dirt, sawdust and sheetrock patching compound from falling into the works. As soon as the carpenters left, I would uncover the typesetter and type as fast as I could. I set every word on each of the 68 pages (and vowed to hire someone to do it for me soon).

Jim Reed and I (Jim was just "helping out" then) rigged the cover picture (a birthday cake, party plates and all) in another corner of the basement. We had to tape balloons to a piece of plywood to make it look festive as opposed to part of the basement. Too, Jim wouldn't let us eat the cake (baked by Charlotte Ford, who didn't work for us then, either) for 24 hours to be sure the pictures came out right (they did).

There was so much positive reaction to that first "slick," typeset magazine that it made up for all the nights when I practically fell asleep at the typesetter or the CoCo.

By last year, when I finally got some professional help on a full-time basis, we tried something new — a record with programs on it. Although a few of you had some problems loading the record into your recorders, and then into your CoCo, some 98 percent of the experiment was successful. We even investigated the possibility of doing it on a regular basis, but, as our circulation kept growing rapidly, the cost became prohibitive.

And what about Anniversary Number Three? We won't tell you, but we will say that I guarantee it will be something that has never — read that NEVER — been done before by anyone. Yes, it is a little off the wall, too. But, we have always contended that Color Computing should be fun. I'm willing to give away a free **RAINBOWfest** tee shirt to anyone who might be able to guess what our Third Anniversary Surprise is.

We'll also be doing some other things to change THE RAINBOW and some of them will become more evident in the next issue. Nothing dramatic, but we like to spruce things up from time to time. And, you'll be seeing some changes in our column lineup, too.

You might note that one of those changes is noted in this month's issue, with the ending of "GameMaster's Apprentice" by Bill Nolan. Bill is one of our longest-running columnists and his adventures into the world of fantasy, D&D and the like have been a staple of THE RAINBOW for a couple of years now. Bill will be continuing his contributions to these pages, but not as the GameMaster's Apprentice. Thanks, Bill, for a fine series.

We do add another feature this month, something we've been wanting to do for quite some time. Ed Ellers, our resident technical type, begins a column that answers your questions about CoCo under the title "Earth To Ed." If you have any questions you would like to see answered in THE RAINBOW, just beam them up, Mr. Spock. Ed will do his best to answer them.

The word from our latest **RAINBOWfest**: Wow! The New Brunswick show was the best we've ever had, both in terms of attendance and enthusiasm. And that, two days after the worst snow storm of the winter hit the New Jersey area, was a real tribute to CoCo Community.

Attendance was more than 10,000, which surpassed "CoCo's Very First Show" in Chicago a year ago. Don't worry midwesterners: We'll be back in the Windy City in June (22-24) and it is a simple matter to take the record back.

Also, we expect **RAINBOWfest**-Chicago to be the largest show ever in terms of exhibitors. As I write this, it is still two months away and, already, almost 50 booths have been filled. For those of you who

*(continued on Page 190)*

# Telewriter-64™

## the Color Computer Word Processor

- **3 display formats: 51/64/85 columns × 24 lines**
- **True lower case characters**
- **User-friendly full-screen editor**
- **Right justification**
- **Easy hyphenation**
- **Drives any printer**
- **Embedded format and control codes**
- **Runs in 16K, 32K, or 64K**
- **Menu-driven disk and cassette I/O**
- **No hardware modifications required**

### THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

> *...one of the best programs for the Color Computer I have seen...*
> — Color Computer News, Jan. 1982

### TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

### 64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

### 64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

### RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

### FEATURES & SPECIFICATIONS:

**Printing and formatting:** Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

RAINBOW
CERTIFICATION
SEAL

**File and I/O Features:** ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

**Editing features:** Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

> *...truly a state of the art word processor... outstanding in every respect.*
> — The RAINBOW, Jan. 1982

### PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs $49.95 on cassette, $59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 Nob Street
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add $2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.

WoW TALKER

* YOUR COMPUTER CAN TALK,
COLOR COMPUTER 16K,32K,64K
PROGRAMS LOADABLE TO DISK

* SAYS WORDS, SENTENCES, STORIES

* YOU CAN LEARN PHONETIC SPEECH AS
YOU CREATE YOUR OWN WORDS

* DICTIONARY OF WORDS

* PLUGS INTO THE ROM PACK SLOT
COMES AS A CARTRIDGE

* " TALKER " COMES COMPLETE:

1. ASSEMBLED AND TESTED
2. OPERATION MANUAL
3. PROGRAM TO RUN TALKER
4. DEMONSTRATION PROGRAM
5. PROGRAM TO CREATE WORDS
6. CASSETTE OF SOFTWARE
7. SPEAKS THROUGH TV SPEAKER

* 15 DAY SATISFACTION GUARANTEED
* 90 DAY MANUFACTURER WARRANTY

SEND MONEY ORDER OR CHECK FOR

$$$$$$$$$$ $34.95 $$$$$$$$$$

PLUS $2.00 SHIPPING AND HANDLING.
C.O.D. ADD $3.00

TALKER 1
BROWN ELECTRONICS
BOX 274
2737 WASHINGTON CENTER ROAD
FORT WAYNE, INDIANA 46818

* CHECKS MUST CLEAR BEFORE SHIPMENT
* WRITE FOR BROCHURE

WoW TALKER

## BUILDING JUNE'S RAINBOW

# CoCo Musicale Issue . . .
# Bound for Chicago Edition . . .
# And, Ed Ellers As Himself . . .

For a time, I attended engineering school on a bass tuba music scholarship. One result of that odd combination is that I select my stereo equipment as much for raw power and electronic gimmickry as for any capacity to faithfully reproduce music. I'm one who loves for the windows to rattle and the walls to pulsate as "Dark Side of the Moon" plays. When I bought a 16-channel graphic equalizer a few years ago, it was more for tinkering than for enhancing reproduction.

One of my pipe dreams has been to hook up my CoCo to my stereo and assault the entire neighborhood with "Overture in *SOUND RND(255),1*." Better still, take that terrific CoCo rendition of the *Hill Street Blues* theme I heard a while back and hook it up to a heavy metal rock group's amplifiers! In a meeting with our highly talented cover artist, Fred Crawford, I mentioned that if there's a CoCo hacker's heaven, it's got to have a heckuva band. Fred shares his vision of how it might be on this month's cover. I love it; and the more I think about it, it's probably more near-fetched than far.

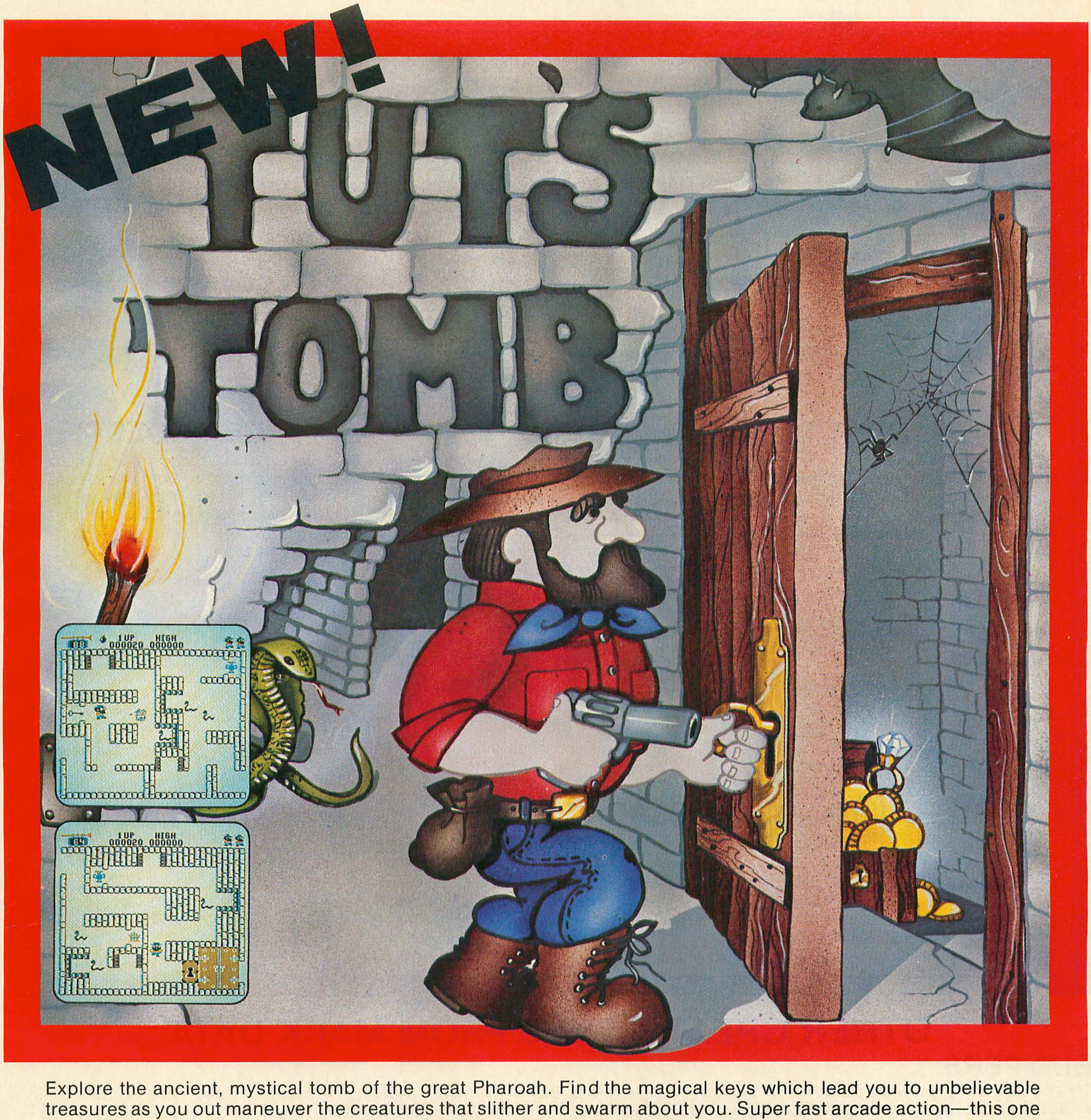
Only a short while back, if you'd have asked me about four-part harmony on the Color Computer, such as we have in this issue, I'd have said it was impossible. Wonder what we'll be doing two years from now! Well, if you hear a CoCo combo or spot a Color Computer marching band sometime soon, I predict it'll be from Alcorn State University and under the leadership of Larry Konecky, the institution's director of CAI in music and a regular musical CoCo contributor to THE RAINBOW. We couldn't have a music issue without Larry, and he's come through for us again with "Tone Row Composing," in which he adapts the 12-tone method of composing to the CoCo! Besides that, there's a Konecky connection to Brad Scoffin's "Two For The Composer" article, which relies on Larry's *CoCo Composing* program published in our December issue.

If you're into making CoCo compositions, turn first to "Making Four-Part Harmony Easier" by Bob Ludlum for a machine language music synthesis program to add to your repertory. For a classical note, Tommy and Gail Pollock's Color Computer arrangements from Handel and Bach are complete with staccato notes and accents. For a music lesson, try "This Guitar Tutor Doesn't Fret" by Chris Phillips for instruction and testing on guitar chords.

"The Computer Chord Finder," on the other hand, was written by Robert Rogers, a professional organ player. "LoCo CoCo And The 1812" combines the unlikes of "I've Been Working on the Railroad" and Tchaikovsky's "1812 Overture." Ready for "A Little String Music"? Joe Hayden has that and more in his program, *The Last Sound Off*. Gordon Martens teaches you to tickle the ivories in "The Piano Tutor." What an assemblage! Everything but a kazoo. CoCo becomes sort of a one-machine band!

Somehow, we still have a full mix of nonmusical articles and programs as well, including — CoCo fanfare music, please — our new "Scoreboard Pointers" section, with tips for gamers, . . . and "Earth To Ed," our latest technical Q&A column, with answers to reader letters by RAINBOW technical writer Ed Ellers. This new reader service promises to be a highly-read adjunct to our popular "Downloads" technical advice section. So, in this last stanza, my usual refrain: If you haven't climbed on the bandwagon yet with a subscription, get into the swing of things. Just $28 will get you in step with the crowd!

— **Jim Reed**



Explore the ancient, mystical tomb of the great Pharoah. Find the magical keys which lead you to unbelievable treasures as you out maneuver the creatures that slither and swarm about you. Super fast arcade action—this one will knock your socks off with 16 screens of incredible color and sound. $24.95 cassette, $27.95 disc. Requires 32K.

## TIME FIGHTER

Pilot your MD-64 fighter through a hazardous time tunnel. Your mission is to destroy the dreaded Time Guardian who threatens the natural order of the universe. In order to reach this menace you must fight aerial dangers from strange and different time zones. $24.95 cassette, $27.95 disc. Requires 16K.

TIME FIGHTER

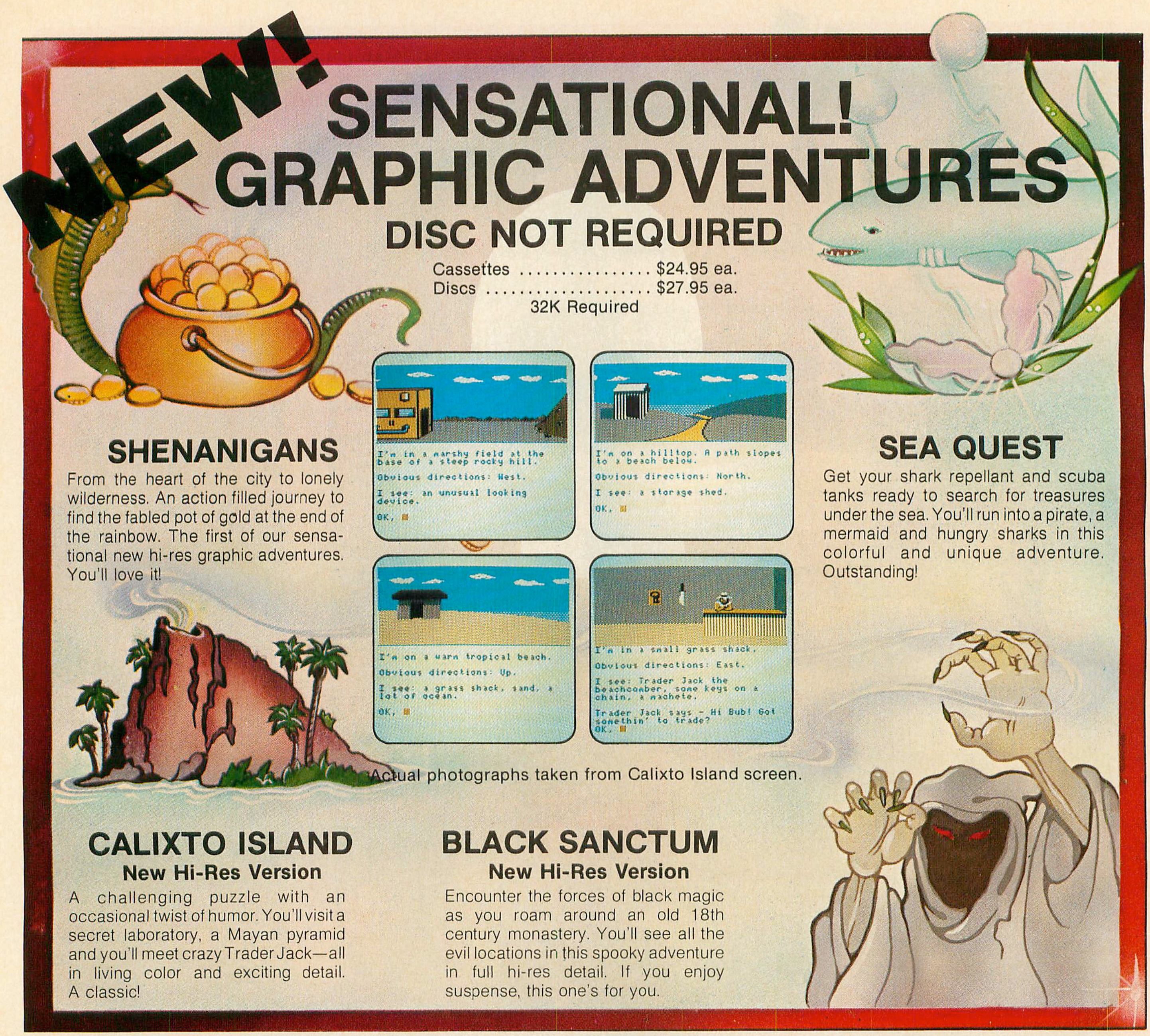
MD

Mark Data Products

see us at RAINBOWfest CHICAGO

24001 Alicia Pkwy., #207, Mission Viejo, CA 92691 • (714) 768-1551

ORDERING INFORMATION: Phone your order for speedy delivery. Use your MasterCard or Visa. We also accept checks and money orders. ALL ORDERS: Please add $2.00 shipping and handling in the continental U.S. All others, add air shipping and $3,00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. Distributed in Canada by Kelly Software Distributors. SOFTWARE AUTHORS: Contact us for exciting marketing details.



# SENSATIONAL! GRAPHIC ADVENTURES

## DISC NOT REQUIRED

Cassettes ................ $24.95 ea.
Discs ................... $27.95 ea.
32K Required

### SHENANIGANS

From the heart of the city to lonely wilderness. An action filled journey to find the fabled pot of gold at the end of the rainbow. The first of our sensational new hi-res graphic adventures. You'll love it!

```
I'm in a marshy field at the
base of a steep rocky hill.

Obvious directions: West.

I see: an unusual looking
device.

OK, ■
```

```
I'm on a hilltop. A path slopes
to a beach below.

Obvious directions: North.

I see: a storage shed.

OK, ■
```

```
I'm on a warm tropical beach.

Obvious directions: Up.

I see: a grass shack, sand, a
lot of ocean.

OK, ■
```

```
I'm in a small grass shack.

Obvious directions: East.

I see: Trader Jack the
beachcomber, some keys on a
chain, a machete.

Trader Jack says - Hi Bub! Got
somethin' to trade?
OK, ■
```

Actual photographs taken from Calixto Island screen.

### SEA QUEST

Get your shark repellant and scuba tanks ready to search for treasures under the sea. You'll run into a pirate, a mermaid and hungry sharks in this colorful and unique adventure. Outstanding!

### CALIXTO ISLAND

**New Hi-Res Version**

A challenging puzzle with an occasional twist of humor. You'll visit a secret laboratory, a Mayan pyramid and you'll meet crazy Trader Jack—all in living color and exciting detail. A classic!

### BLACK SANCTUM

**New Hi-Res Version**

Encounter the forces of black magic as you roam around an old 18th century monastery. You'll see all the evil locations in this spooky adventure in full hi-res detail. If you enjoy suspense, this one's for you.

## OTHER GREAT GAMES FROM MARK DATA

### BUMPERS

Tension mounts as you wildly race through a hidden obstacle course. Barrier walls are invisible until you bump into them and you must proceed cautiously as each dead end has a hidden booby trap. Especially exciting when two players compete simultaneously.

### COSMIC CLONES

Clonial Warriors, Super-Klones, Double Bombs and "the Death Layer" relentlessly challenge the most skillful player in this unique, fast action game. This is one of our favorites.

### GLAXXONS

Pit your playing skill against squadrons of swooping, diving spacecraft. Fast and furious with seven selectable skill levels and automatic game acceleration. . .guaranteed to blister your joystick finger.

### EL BANDITO

El Bandito has to be a crafty little hombre to stay alive as he loots the local countryside. Escape into a tunnel to avoid that angry spider. . .race around the corner towards your lair. Two players may compete simultaneously in this unusual game.

All games: Cassettes ... $24.95 ea. Discs ... $27.95 ea. 16K Required

MD

*Mark Data Products*

see us at RAINBOWfest CHICAGO

24001 Alicia Pkwy., #207, Mission Viejo, CA 92691 • (714) 768-1551

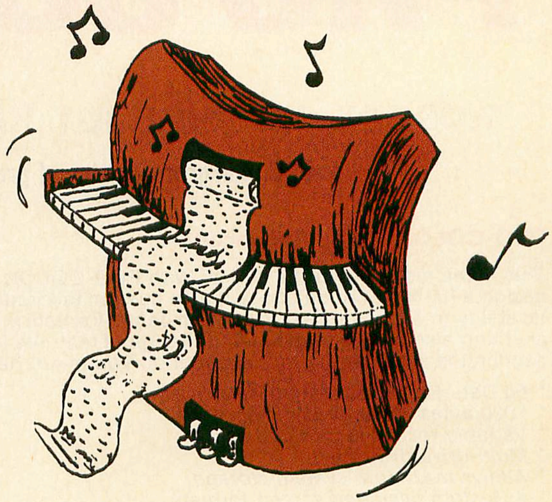
ORDERING INFORMATION: Phone your order for speedy delivery. Use your MasterCard or Visa. We also accept checks and money orders. ALL ORDERS: Please add $2.00 shipping and handling in the continental U.S. All others, add air shipping and $3.00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. Distributed in Canada by Kelly Software Distributors. SOFTWARE AUTHORS: Contact us for exciting marketing details.

MUSIC

16K

# The Piano Tutor

### By Gordon Martens



*Turn your computer's keys into a piano keyboard and let this piano tutor teach you to play!*

*Piano* is a program written for the 16K BASIC Color Computer. The program should run in 4K with remarks deleted.

Upon running, the title page is displayed with an option for instructions. The piano keyboard is then drawn on the screen. The bottom row and part of the next row on your computer's keyboard now become piano keys! These keys are labeled on the screen piano. Options are shown across the bottom. The "speed" or duration of each note is changed by pressing the Space Bar and then a number one through eight. Normal mode is PLAY; however, by pushing the Space Bar and then 'L', you enter the LEARN mode. In this mode, pushing a number one through eight selects a song for the computer to teach you, or a '0' lists available songs! Once a song is selected, the song title is shown across the screen bottom and the key to press for the proper notes are indicated, one at a time, by an inverse '0'. Speed may also be changed in the LEARN mode at any time.

A brief description of each section of the program follows:

| | |
|---|---|
| 01-07 | Credits |
| 08 | High Speed POKE |
| 09-23 | Draw Piano Keys |
| 24 | Display Header |
| 25-37 | Label Keys |
| 38 | Display Options |
| 39 | Define Notes |
| 40 | Exit High Speed POKE |
| 41-44 | Sound Routine |
| 45-51 | Change Options |
| 52-85 | Songs |
| 86-92 | Learn Routine |
| 93-95 | Initialize |
| 96-105 | Instructions |

The program uses semi-graphics character string codes to draw the piano keyboard. The speed poke is used for drawing the screen only, and may be removed by deleting lines 8 and 40. Simple subroutines are used for drawing the screen to minimize duplication of lines. Sound statements provide compatibility with standard BASIC. In the sound routine the notes are predefined on line 39 (except for the ',.;/' keys). Sound duration 'Q' is modified in the change options routine, line 46. The actual sound routine loop is lines 43 and 44, where keystrokes are turned to notes. Pressing the Space Bar breaks you out of this main routine to allow changes in note duration or mode.

In the LEARN mode, for each song selected, the data pointer is set by reading past the notes in the other songs. The notes are then read one at a time on line 87. Line 88 sets the *PRINT* @ location for the note and an inverse 'O' is placed at that location, over the key's label. Notes are read in as per the key labels and not actual musical scale notes. Line 92 replaces the song title (displayed at bottom of screen in learn mode) with asterisks at the end of the song. The data pointer is reset on line 55. Return to PLAY mode is automatic.

To change the available songs simply play them, write down the key sequence, and replace one of the data statements. The song label must also be changed. Also, the *FOR/NEXT READ* loops which set the data pointers must be adjusted to count properly for all songs beyond the one you change.

I hope you enjoy playing the *Piano* as much as I enjoyed writing it. The program structure is as efficient as my one year of BASIC programming experience would permit so I hope you pros out there will have a little mercy on me.

For anyone who does not like typing, I will supply a copy on cassette for $6.95 Canadian or $5.75 U.S. funds.

---

*(Gordon Martens has a technical diploma in chemical engineering technology and is employed with a major oil company near Fox Creek, Alberta, a town of 2,000. He's been programming in BASIC as a hobby for one year.)*

| | | | |
|---|---|---|---|
| 21 | 12 | 89 | 205 |
| 42 | 31 | 99 | 126 |
| 53 | 114 | END | 209 |
| 72 | 10 | | |

**The listing:**

```
1 'PIANO VER 1.0
2 'BY G.J. MARTENS
```

# PRO-COLOR-SERIES

©1984 BY DERRINGER SOFTWARE, INC.

## NOBODY, BUT NOBODY HAS DONE IT LONGER AND BETTER THAN US!

**A fully intergrated series of programs that offers a full range of information tracking capability.**

### PRO-COLOR-FILE *Enhanced* $79.95

This is the main link in the series. With PRO-COLOR-FILE, you can design a full featured database that is custom tailored to your needs. Its ability to allow the user to custom define formats is unmatched by anything else on the market. A full range of features for information handling is available for any application you might have:

- * *60 Data Fields for storing data*
- * *1020 bytes capacity per record*
- * *Variable record length capability*
- * *Multi-drive drive ability*
- * *Allows maximum system storage*
- * *4 Custom designed screen formats*
- * *28 Equation lines (+ – * /)*
- * *8 Custom designed report formats*
- * *Send reports to printer or screen*
- * *Summarize file by groups of records*
- * *Column totals and averages*
- * *Posting routine performs file wide calculations and updates fields*
- * *6 Custom designed mailing label formats*
- * *Custom designed menus for selection of reports and label formats*
- * *Selectable password protection for data entry screens and reports*
- * *Sort any size file*
- * *3 level sort capability*
- * *Select options for sorting or reporting sub-sets of a file*
- * *Duplicate records and fields*
- * *Cursor controlled text editing*
- * *Fast record selection via indexing*
- * *Global file searching*

As a database is created, all of the formats are stored in a file which means you won't have to enter it each time you want to print a report or label. Once your database is up and running, you can install a limited menu that will lead even the most timid user through the program. Since menu selection of report formats are custom made, you'll know exactly which format does what.

PRO-COLOR-FILE is also supported by a NATIONAL USERS' group. Their quarterly newsletter is packed with ideas for using PRO-COLOR-FILE to its fullest. A listing of database programs that have already been created is also provided for comparing notes with other users. Useful database information such as magazine articles are available on a data disk for use on your own system.

Think about it, how can a program exist for over a year and a half, be sold in every state and overseas, and have the support of a national users' group? Simple, it's that good!

### PRO-COLOR-FORMS** $39.95

This is the second link in the series. PRO-COLOR-FORMS offers the ability to merge data files with text files. Just imagine being able to place the data you enter with PRO-COLOR-FILE anywhere on a sheet of paper, either by itself or within an external source of text, then you'll have the picture. This means you could write a general letter to a list of people but have each one custom printed with their name and address. You can pre-enter checks into a data base and then have the checks printed on form-feed checks. You might even use form-feed statements for sending out to customers at the end of each month. All of the parameters can be modified to indicate just what size "page" you need for any application:

- * *6 Menu Selectable formats*
- * *Page width from 40 to 133 characters*
- * *Lines per page from 7 to 66*
- * *Supports printer control codes*
- * *Converts any ASCII file for use*
- * *Prints multiple copies*
- * *Interfaces with PRO-COLOR-FILE*
- * *Password protection*

If you need to generate forms from your data files then chances are you can do just that with PRO-COLOR-FORMS. Form letters, billing statements, index cards, or even post cards can be used easily.

### PRO-COLOR-DIR** $24.95

The latest addition to the series is a utility for organizing disk directories into one nice listing. PRO-COLOR-DIR reads the directory of a diskette and then stores valuable information about each program into a master data file. This data file can then be accessed by PRO-COLOR-FILE for sorting, searching and reporting. PRO-COLOR-DIR will create a record for each filename on a diskette and store the following information about each one:

- * *Diskette ID name*
- * *Date diskette was created*
- * *Last date diskette was updated*
- * *Filename and extension*
- * *File type (BASIC, ML, Text, Data)*
- * *Number of Grans allocated*
- * *Number of sectors allocated and used*
- * *Machine Language program addresses*

PRO-COLOR-DIR allows for hardcopies of a single diskette's files and has a versatile label printing routine. A global replace function can re-store a diskette's files with deleted files being removed or new ones appended automatically.

---

***PRO-COLOR-FORMS & PRO-COLOR-DIR Require PRO-COLOR-FILE to be used***
**Requires 32K Disk Basic**

see us at RAINBOWfest CHICAGO

## * RAINBOWFEST SPECIAL *

Take advantage of this special offer NOW to get the best database series on the market at a super price!

| | SALE | |
|---|---|---|
| PRO-COLOR-FILE *Enhanced* | $59.95 | *Save $20* |
| PRO-COLOR-FORMS | $29.95 | *Save $10* |
| PRO-COLOR-DIR | $19.95 | *Save $5* |
| **ALL THREE** | $99.95 | *Save $44* |

Checks
Money Order
Visa
Master Card
COD
Add $3.00 for Shipping & Handling

Derringer Software Inc., P.O. Box 5300, Florence, S.C. 29502 — (803) 665-5676 9 a.m. - 5 p.m.

Note: All of our programs have registration cards - If you've purchased one from another dealer, then you should be registered with us. If not, send your name, program ID# and where the program was purchased. We want to keep you informed about changes.

```
3 'BOX 668, FOX CREEK, ALBERTA
4 'T0H 1P0
5 'JANUARY 1984
6 GOTO94
7 'draw keyboard
8 POKE65495,0
9 X=130:Y=354:CLS0
10 FORA=X TOY STEP32:PRINT@A,CHR
$(143+64);:NEXTA
11 X=X+1:Y=Y+1:IFX>=160THEN12ELS
E10
12 X=132:Y=356
13 FORA=X TOY STEP32:PRINT@A,CHR
$(138+64);:NEXTA
14 X=X+3:Y=Y+3:IFX>=160THEN15ELS
E13
15 X=132:Y=259:B=128:C=136:GOSUB
21
16 X=133:Y=260:B=197:C=139:GOSUB
21
17 X=141:Y=237:B=128:C=148:GOSUB
21
18 X=142:Y=238:B=197:C=151:GOSUB
21
19 X=153:Y=249:B=128:C=159:GOSUB
21
20 X=154:Y=250:B=197:C=160:GOSUB
21:GOTO24
21 FORA=X TOY STEP32:PRINT@A,CHR
$(B);:NEXTA
22 X=X+3:Y=Y+3:IFX>=C THEN23ELSE
21
23 RETURN
24 PRINT@46,"piano";:PRINT@74,"b
y";:PRINT@77,"g";:PRINT@79,"j";:
PRINT@81,"martens";
25 W=355:L$="Z":GOSUB37
26 L$="X":GOSUB37
27 L$="C":GOSUB37
28 L$="V":GOSUB37
29 L$="B":GOSUB37
30 L$="N":GOSUB37
31 L$="M":GOSUB37
32 L$="<":GOSUB37
33 L$=">":GOSUB37
34 L$="?":GOSUB37
35 PRINT@132,"S";:PRINT@135,"D";
:PRINT@141,"G";:PRINT@144,"H";:P
RINT@147,"J";:PRINT@153,"L";:PRI
NT@156,"+";
36 GOTO38
37 PRINT@W,L$;:W=W+3:RETURN
38 J$="2":Q=2:PRINT@419,"speed";
:PRINT@425,J$;:PRINT@428,"mode";
:PRINT@433,"PLAY ";:PRINT@440,"s
ong";:PRINT@445,"0";
39 Z=89:S=99:X=108:D=117:C=125:V
=133:G=140:B=147:H=153:N=159:J=1
65:M=170:L=180
40 POKE65494,0
41 'sound routine
42 I$=INKEY$:IFI$=""THEN42ELSEIF
I$="Z"THENSOUNDZ,Q ELSEIFI$="S"T
HENSOUNDS,Q ELSEIFI$="X"THENSOUN
DX,Q ELSEIFI$="D"THENSOUNDD,Q EL
SEIFI$="C"THENSOUNDC,Q ELSEIFI$=
"V"THENSOUNDV,Q ELSEIFI$="G"THEN
SOUNDG,Q ELSEIFI$="B"THENSOUNDB,
Q ELSEIFI$="H"THENSOUNDH,Q
43 IFI$="N"THENSOUNDN,Q ELSEIFI$
="J"THENSOUNDJ,Q ELSEIFI$="M"THE
NSOUNDM,Q ELSEIFI$=","THENSOUND1
76,Q ELSEIFI$="L"THENSOUNDL,Q EL
SEIFI$="."THENSOUND185,Q ELSEIFI
$=";"THENSOUND189,Q ELSEIFI$="/"
THENSOUND193,Q ELSEIFI$=" "THENG
OTO45
44 IFR=1THENRETURNELSE42
45 PRINT@433,"?????";
46 J$=INKEY$:IFJ$=""THEN46ELSEIF
J$="L"THENPRINT@433,"LEARN";:GOT
O49ELSEIFR=1THENPRINT@433,"LEARN
";:MM=VAL(J$)ELSEIFR=0THENPRINT@
433,"PLAY ";:MM=VAL(J$)ELSE45
47 IFMM<1ORMM>8THEN45ELSEQ=MM:PR
INT@425,J$;
48 GOTO39
49 IFR=0THENPRINT@445,"?";:ELSE4
2
50 I$=INKEY$:IFI$=""THEN50ELSEIF
R=0ANDI$="0"THENGOSUB103
51 I=VAL(I$):IFI<1ORI>8THEN50ELS
EPRINT@445,I$;
52 RESTORE
53 ONI GOTO55,59,63,67,71,75,79,
83
54 '1 mary had little lamb
55 PRINT@485,"MARY HAD A LITTLE
LAMB";:
56 GOSUB87:GOTO56
57 DATAN,B,V,B,N,N,N,B,B,B,N,<,<
,N,B,V,B,N,N,N,N,B,B,N,B,V,*
58 'three blind mice
59 FORNN=1TO27:READNO$:NEXTNN:PR
INT@488,"THREE BLIND MICE";
60 GOSUB87:GOTO60
61 DATAC,X,Z,C,X,Z,B,V,V,C,B,V,V
,C,B,<,<,M,N,M,<,<,B,B,<,<,<,M,N
,M,<,<,B,B,B,<,<,M,N,M,<,<,<,B,V
,C,X,Z,*
62 'row your boat
63 FORNN=1TO76:READNO$:NEXTNN:PR
INT@489,"ROW YOUR BOAT";
64 GOSUB87:GOTO64
65 DATAZ,Z,Z,X,C,C,X,C,V,B,<,<,<
,B,B,B,C,C,C,Z,Z,Z,B,V,C,X,Z,*
66 'jimmy crack corn
67 FORNN=1TO104:READNO$:NEXTNN:P
```

```
RINT@488,"JIMMY CRACK CORN";
68 GOSUB87:GOTO68
69 DATAZ,Z,V,V,V,C,B,B,Z,Z,B,B,B
,V,N,N,V,V,V,N,N,J,J,>,>,<,<,J,B
,V,*
70 'london bridge
71 FORNN=1TO135:READNO$:NEXTNN:P
RINT@489,"LONDON BRIDGE";
72 GOSUB87:GOTO72
73 DATAB,N,B,V,C,V,B,X,C,V,C,V,B
,B,N,B,V,C,V,B,X,B,C,Z,Z,*
74 'amazing grace
75 FORNN=1TO161:READNO$:NEXTNN:P
RINT@489,"AMAZING GRACE";
76 GOSUB87:GOTO76
77 DATAZ,V,V,N,V,N,B,V,X,V,X,Z,Z
,V,V,N,V,N,B,<,<,N,<,<,N,<,N,V,Z
,X,V,V,X,Z,Z,V,V,N,V,N,B,V,*
78 'jesus loves me
79 FORNN=1TO204:READNO$:NEXTNN:P
RINT@489,"JESUS LOVES ME";
80 GOSUB87:GOTO80
81 DATAB,C,C,X,C,B,B,N,N,<,N,N,B
,B,B,C,C,X,C,B,B,N,N,B,Z,C,X,Z,B
,C,B,N,<,B,C,Z,C,X,B,C,B,N,<,N,B
,Z,C,X,Z,*
82 'kumbaya my lord
83 FORNN=1TO254:READNO$:NEXTNN:P
RINT@488,"KUMBAYA MY LORD";
84 GOSUB87:GOTO84
85 DATAZ,C,B,B,B,N,N,B,Z,C,B,B,B
,V,C,X,Z,C,B,B,B,N,N,B,V,C,Z,X,X
,Z,*
86 'learn routine
87 R=1:READNO$
88 IFNO$="*"THEN92ELSEIFNO$="Z"T
HENNP=355ELSEIFNO$="X"THENNP=358
ELSEIFNO$="C"THENNP=361ELSEIFNO$
="V"THENNP=364ELSEIFNO$="B"THENN
P=367ELSEIFNO$="N"THENNP=370ELSE
IFNO$="M"THENNP=373ELSEIFNO$="<"
THENNP=376ELSEIFNO$=">"THENNP=37
9ELSEIFNO$="?"THENNP=382
89 IFNO$="S"THENNP=132ELSEIFNO$=
"D"THENNP=135ELSEIFNO$="G"THENNP
=141ELSEIFNO$="H"THENNP=144ELSEI
FNO$="J"THENNP=147ELSEIFNO$="L"T
HENNP=153ELSEIFNO$="+"THENNP=156
90 PRINT@NP,"o";:GOSUB42:PRINT@N
P,NO$;:RETURN
91 '
92 R=0:PRINT@433,"PLAY ";:PRINT@
445,"0";:PRINT@485,"************
**********";:GOTO39
93 'initiallize
94 CLS8:PRINT@173,"piano";:PRINT
@262,"INSTRUCTIONS (Y/N)?";
95 I$=INKEY$:IFI$=""THEN95ELSEIF
I$="Y"THEN97ELSEIFI$="N"THEN8ELS
E95
96 'instructions
97 CLS5:PRINT@13,"piano";:PRINT@
64,"WELCOME TO THE COLOR COMPUTE
R   PIANO. A PIANO KEYBOARD WILL
 BE DRAWN ON YOUR SCREEN. IT WIL
L   SHOW YOU WHICH KEY TO PUSH F
OR  EACH PIANO KEY. THE ACTUAL N
OTESAVAILABLE ARE MIDDLE 'C' TO"
98 PRINT"'E'. SHARPS & FLATS (SM
ALL BLACKKEYS) ARE INCLUDED.":PR
INT@352,"THE PIANO MAY OPERATE A
T EIGHT  DIFFERENT SPEEDS AND IN
 TWO      DIFFERENT MODES.":PRINT
@480,"HIT <ENTER> TO CONTINUE...
...";:INPUTE
99 CLS5:PRINT@13,"piano";:PRINT@
64,"THE MODE IS CHANGED BY PRESS
ING THE SPACE BAR AND THEN A NUM
BER 1-8 FOR SPEED, OR AN 'L' FOR
 LEARN MODE.":PRINT@224,"ONCE IN
 THE LEARN MODE, SELECT  A NUMBE
R 1-8 TO CHOOSE THE SONG"
100 PRINT"YOU WISH TO LEARN. THE
 COMPUTER WILL THEN SHOW YOU WHI
CH NOTES  TO PLAY, ONE AT A TIME
. SPEED   MAY BE CHANGED IN LEAR
N MODE BY SPACE BAR AND NUMBER 1
-8.":PRINT@480,"HIT <ENTER> TO C
ONTINUE......";:INPUTE
101 CLS5:PRINT@13,"piano";:PRINT
@64,"ONCE A SONG IS SELECTED IT
MUST BE COMPLETED. SONG TITLE IS
      DISPLAYED AT THE SCREEN BOT
TOM. RETURN TO THE PLAYMODE IS A
UTO- MATIC.":PRINT@256,"YOU MAY
REVIEW AVAILABLE SONGS  BY TYPIN
G A '0' FOR SONG NUMBER."
102 PRINT@480,"HIT <ENTER> TO CO
NTINUE......";:INPUTE
103 CLS3:PRINT@13,"piano";:PRINT
@64," AVAILABLE SONGS IN THE LEA
RN              MODE ARE:":PRINT
@163,"1. MARY HAD A LITTLE LAMB"
;:PRINT@195,"2. THREE BLIND MICE
      ";:PRINT@227,"3. ROW YOUR
BOAT        ";:PRINT@259,"4. JI
MMY CRACK CORN      ";
104 PRINT@291,"5. LONDON BRIDGE
        ";:PRINT@323,"6. AMAZING
 GRACE        ";:PRINT@355,"7.
JESUS LOVES ME        ";:PRINT@3
87,"8. KUMBAYA MY LORD       ";:
PRINT@448,"    HIT 'B' TO BEGIN O
R 'R' TO        REVIEW INSTRUCT
IONS.     ";
105 I$=INKEY$:IFI$=""THEN105ELSE
IFI$="B"THEN8ELSEIFI$="R"THEN97E
LSE105
```

**MUSIC**

**16K**
**ECB**

*An adaptation for computer of a major 20th century innovation in musical composition*

# Tone Row Composing

## By Larry Konecky

A method of composing, called the 12-tone or serial method, is one of the most significant musical innovations of the 20th century. Developed by Arnold Shoenberg during the beginning of this century, it has been referred to by a number of different names and has been received with much controversy. This method of composing resulted from a search by composers for alternatives to traditional methods of composing.

A tone row composition is normally based on a series of 12 notes which are chosen from the 12 pitches of a chromatic scale. Each of the notes is used only once when a row is constructed. This series of notes or "row" forms 11 intervals (pitch distances between notes) which generally results in a melody of unique profile and character. These notes and intervals serve as the raw material out of which a tone row composition is developed.

When composing in this method, no tone is repeated until the series has been completed. This is an attempt to insure that each tone is the equal of each of the others. The series may be used in any transposition (starting on any of the 12 tones), as long as the sequence of intervals is retained. Also, any tone of the row can be sounded in any octave. The row may be played retrograde (backward), inverted (mirror image) or retrograde inverted. With these four forms of the row (original, retrograde, inversion, and retrograde inversion) and their transpositions, 48 different series are available for use from one initial series of notes.

*(Larry Konecky holds a master's degree in guitar performance and is working on a doctor of music education degree. He is currently Director of CAI in Music at Alcorn State University.)*

When musicians compose in the tone row method or analyze a composition which uses this method, a chart of the 48 possibilities is first drawn up in a 12 x 12 matrix. This matrix is normally constructed in the following manner:

1) Write the notes of the original series at the initial pitch level on the top row.
2) Write the notes of the inversion down the first column, starting with the first note of the original row.
3) Complete the chart by writing in each line the transposition of the original which starts with the note of the inversion in the first column.

The completed chart gives all transpositions of the original (reading from left to right), of the retrograde (reading from right to left), of the inversion (reading from top to bottom), and of the retrograde inversion (reading from bottom to top).

**Figure 1**

**12-TONE MATRIX**

**BUILT ON THE FOLLOWING PRIME ROW:**
**D, E*b*, F, C, A, B*b*, B, C#, G, F#, E, A*b***

| | 0 | 1 | 3 | 10 | 7 | 8 | 9 | 11 | 5 | 4 | 2 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12** | D | E*b* | F | C | A | B*b* | B | C# | G | F# | E | A*b* |
| **11** | C# | D | E | B | A*b* | A | B*b* | C | F# | F | E*b* | G |
| **9** | B | C | D | A | F# | G | A*b* | B*b* | E | E*b* | C# | F |
| **2** | E | F | G | D | B | C | C# | E*b* | A | A*b* | F# | B*b* |
| **5** | G | A*b* | B*b* | F | D | E*b* | E | F# | C | B | A | C# |
| **4** | F# | G | A | E | C# | D | E*b* | F | B | B*b* | A*b* | C |
| **3** | F | F# | A*b* | E*b* | C | C# | D | E | B*b* | A | G | B |
| **1** | E*b* | E | F# | C# | B*b* | B | C | D | A*b* | G | F | A |
| **7** | A | B*b* | C | G | E | F | F# | A*b* | D | C# | B | E*b* |
| **8** | B*b* | B | C# | A*b* | F | F# | G | A | E*b* | D | C | E |
| **10** | C | C# | E*b* | B*b* | G | A*b* | A | B | F | E | D | F# |
| **6** | A*b* | A | B | F# | E*b* | E | F | G | C# | C | B*b* | D |

Reading rows from left to right yields TRANSPOSITIONS.
Reading rows from right to left yields RETROGRADES.
Reading columns from top to bottom yields INVERSIONS.
Reading columns from bottom to top yields RETROGRADE INVERSIONS.

Refer to Figure 1 for an example of a 12-tone matrix built on the following row: D, E*b*, F, C, A, B*b*, B, C#, G, F#, E, A*b*. The numbers, appearing on the top and left of the matrix, represent transpositions which are referenced to the first note of the original (prime) row. When correctly constructed, the first note of the prime row will appear in a diagonal line from the upper-left corner to the bottom-right corner. Also, transposition numbers in the same row and column will always add up to 12. For example, the second column of Figure 1 begins on one and the second row begins on 11.

Having a chart like this, showing all variants of the series at a glance, is an invaluable tool when composing or analyzing 12-tone music; however, constructing such a chart can be a time-consuming procedure. The following program constructs such a chart and conveniently prints it on an 8½" x 11" piece of paper. (The program is written using a Line Printer VII.) All that is needed is to enter the original 12-tone row.

When the program is *RUN*, you are prompted to enter the notes of your row one at a time. Only those 12 notes displayed on the screen may be entered, and each note may be entered only once. After notes are entered, the resulting matrix may be displayed on the screen or sent to a printer.

| | |
|---|---|
| 606 | 183 |
| 1155 | 230 |
| 1500 | 2 |
| END | 31 |

**speed reading $17.95**

Here's a program to help you increase your reading speed dramatically. Reading material appears on the TV screen at the speed you select, training you to read faster than you normally would. You can even vary the speed while reading. Complete with six different text selections. Plus a drill to improve visual span and perception.

Send SASE for free copy of 3 page printout of instructions including many tips to help you read faster.

Speeding your reading takes dedicated effort. With this unique program, your effort will be more efficient, convenient and productive.

**wild party** ~~$35.00~~ **$27.95**

A naughty, sexy computer game for 2 to 6 couples. Game varies every time you play.

Send SASE for free copy of program instructions and detailed description of program.

RAINBOW OCT 83: "would definitely liven up most parties."

**29 monsters $14.95**

A text-adventure game. Send SASE for instructions.

**All programs on cassette tape for 16K Color Computer. Extended BASIC not required. Prices include postage (PA resid. add 6%). Send check to P.O. Box 210, Jenkintown, PA 19046.**

**b & b software**

RAINBOW CERTIFICATION SEAL

**The listing:**

```
10 DIM X(12),N$(12),R$(12),X$(12
),E(12),E$(12):GOTO1000
95 '****************************
96 '** COMPUTE TRANSPOSITIONS **
97 '**      AND  PRINT        **
98 '****************************
100 A=A+1:I=X(A)-X(A+1)
110 FORY=1TO12:X(Y)=X(Y)+I
120 IFX(Y)<0THENX(Y)=X(Y)+12
130 IFX(Y)>11THENX(Y)=X(Y)-12
140 X$(Y)=N$(X(Y)+1):NEXTY
150 IFB=1THENGOSUB400ELSEGOSUB60
0
160 IFA=11THENRETURNELSE100
400 PRINT@D+3," "X$(1)TAB(6)X$(2
)TAB(8)X$(3)TAB(10)X$(4)TAB(12)X
$(5)TAB(14)X$(6)TAB(16)X$(7)TAB(
18)X$(8)TAB(20)X$(9)TAB(22)X$(10
)TAB(24)X$(11)TAB(26)X$(12)TAB(2
8)" ";
410 D=D+32:RETURN
600 PR=12-E(A+1):PR$=E$(PR):IFA=
0THENPR$="12"
602 FORZ=1TO12
603 IFX$(Z)="E&"THENX$(Z)="Eb"
604 IFX$(Z)="A&"THENX$(Z)="Ab"
605 IFX$(Z)="B&"THENX$(Z)="Bb"
606 NEXTZ
610 PRINT#-2,TAB(20)PR$;TAB(23)"
:"TAB(24)X$(1)TAB(27)X$(2)TAB(30
)X$(3)TAB(33)X$(4)TAB(36)X$(5)TA
B(39)X$(6)TAB(42)X$(7)TAB(45)X$(
8)TAB(48)X$(9)TAB(51)X$(10)TAB(5
4)X$(11)TAB(57)X$(12)
620 PRINT#-2,TAB(23)":":RETURN
800 FORZ=1TO12:FORY=1TO12
810 IFR$(Z)=N$(Y)THENX(Z)=Y-1
815 NEXTY,Z
820 I=X(1):FORY=1TO12:E(Y)=X(Y)-
I
830 IF E(Y)<0THENE(Y)=E(Y)+12
840 NEXTY:RETURN
995 '***************************
996 '**     ENTER    ROW      **
997 '***************************
1000 DATA C,C#,D,E&,E,F,F#,G,A&,
A,B&,B
1010 FORY=1TO12:READN$(Y):NEXTY
1020 DATA 0,1,2,3,4,5,6,7,8,9,10
,11
1030 FORY=0TO11:READE$(Y):NEXTY
1100 CLS3
1110 PRINT@35,"*12 TONE MATRIX G
ENERATOR*";
1120 PRINT@102,"*INPUT ORIGINAL
ROW*";
1130 PRINT@164,"CHOOSE FROM THES
E NOTES:";
1140 PRINT@196," C   C#  D   E&
```

```
 E   F  ";
1150 PRINT@228," F#  G   A&  A
 B&  B  ";
1155 PRINT@488," #=SHARP  &=FLAT
 ";
1160 P=0:S=321:FORY=1TO12:P=P+4
1170 IFP>24THENS=385:P=4
1180 PRINT@S+P,;:INPUTR$(Y)
1190 PRINT@S+P,R$(Y)"  ";STRING$(
32-P,175);
1200 FORZ=1TO12:IFR$(Y)=N$(Z)THE
N1230
1210 NEXTZ
1220 PRINT@454," REENTER LAST NO
TE! ";:GOTO1180
1230 FORV=1TO12:IFY=V THEN1250EL
SEIFR$(Y)=R$(V)THEN1220
1240 NEXTV
1250 PRINT@454,STRING$(22,175);:
NEXTY
1260 GOTO2000
1295 '***************************
1296 '**       SCREEN          **
1297 '***************************
1300 FORZ=1TO12:X$(Z)=R$(Z):NEXT
Z:B=1:CLS4:GOSUB800
1310 PRINT@4," * TWELVE TONE MAT
RIX * ";
1320 D=64:GOSUB400:A=0:GOSUB100:
GOTO2000
1395 '***************************
1396 '**       PRINTER         **
1397 '***************************
1400 PRINT@482," *****    PRINTI
NG   *****  ";:FORZ=1TO12:X$(Z)=R
$(Z)
1410 IFX$(Z)="E&" THENX$(Z)="Eb"
1420 IFX$(Z)="A&" THENX$(Z)="Ab"
1430 IFX$(Z)="B&" THENX$(Z)="Bb"
1440 NEXTZ:GOSUB800
1500 PRINT#-2,CHR$(31):PRINT#-2,
TAB(10)"--12 TONE MATRIX--"
1510 PRINT#-2:PRINT#-2:PRINT#-2
1520 PRINT#-2,TAB(3)"BUILT ON TH
E FOLLOWING PRIME ROW:"
1530 PRINT#-2
1540 PRINT#-2,X$(1)", "X$(2)", "
X$(3)", "X$(4)", "X$(5)", "X$(6)
", "X$(7)", "X$(8)", "X$(9)", "X
$(10)", "X$(11)", "X$(12)
1550 PRINT#-2,STRING$(40,"-")CHR
$(30)
1560 FORY=1TO6:PRINT#-2:NEXT
1640 PRINT#-2,TAB(24)E$(E(1))TAB
(27)E$(E(2))TAB(30)E$(E(3))TAB(3
3)E$(E(4))TAB(36)E$(E(5))TAB(39)
E$(E(6))TAB(42)E$(E(7))TAB(45)E$
(E(8))TAB(48)E$(E(9))TAB(51)E$(E
(10))TAB(54)E$(E(11))TAB(57)E$(E
(12))
1650 PRINT#-2,TAB(19)STRING$(42,
"-")
1660 A=0:GOSUB600
1670 B=2:GOSUB100
1700 FORY=1TO6:PRINT#-2:NEXT
1710 PRINT#-2,TAB(13)"Reading ro
ws from left to right yields TRA
NSPOSITIONS.":PRINT#-2
1720 PRINT#-2,TAB(13)"Reading ro
ws from right to left yields RET
ROGRADES.":PRINT#-2
1730 PRINT#-2,TAB(13)"Reading co
lumns from top to bottom yields
INVERSIONS.":PRINT#-2
1740 PRINT#-2,TAB(9)"Reading col
umns from bottom to top yields R
ETROGRADE INVERSIONS."
1750 FORZ=1TO20:SOUND150,1:NEXT
1995 '***************************
1996 '**        MENU           **
1997 '***************************
2000 PRINT@482,"  (S)CREEN    (P)R
INT    (N)EW  ";
2010 I$=INKEY$:IFI$=""THEN2010
2020 IFI$="S"THEN1300
2030 IFI$="P"THEN1400
2040 IFI$="N"THEN1100
2050 GOTO2010
```

RETIREMENT PLANNING MODEL

★★★★★★★★★★★★

PENSION? SOCIAL SECURITY? IRA? EARLY RETIREMENT? SAVINGS? ? INCOME TAXES? INFLATION? TIME?

After first helping you organize your present assets, the model projects these assets to their value at the retirement age you select. Using your assets at retirement as a base, a detailed cash flow analysis is conducted for each year of your retirement.

The variables shown above are considered in all calculations. Each analysis stops when you either run out of funds or reach the age of 100. The model is designed for "what if" analysis and optional printer output. A vital tool for comprehensive retirement planning. Fully documented.

Requires 16K ext. basic. Specify if for 32K CoCo. II.

* * *

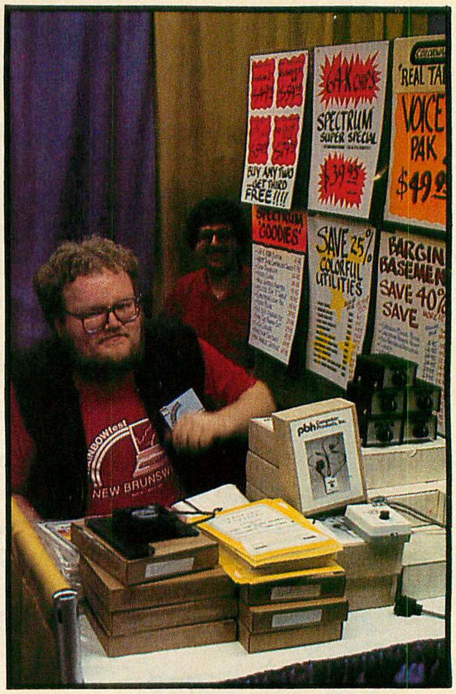
Ill. residents add 8% sales tax

RAINBOW CERTIFICATION SEAL

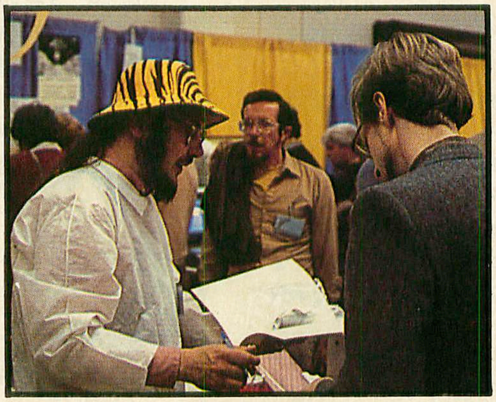
Tape $34.95
Disc $39.95

A&P SOFTWARE
P.O. Box 202
Glenview, IL
60025

Susan Davis, shown at her Sugar Software booth, held a seminar on Women and Computers.

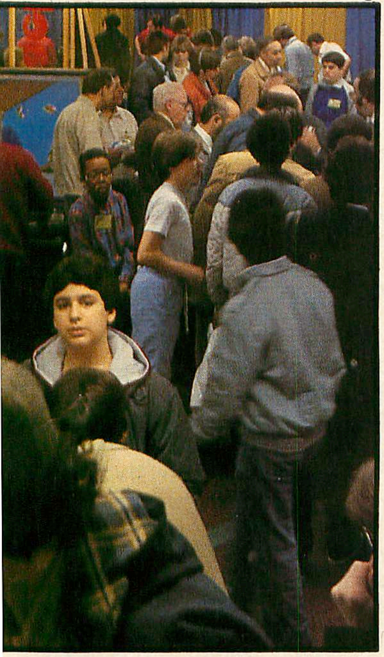


# RAINBOWfest Report:



Martin Goodman, M.D. (above left) of Cheshire Cat Computer Creations demonstrates *Graphicom* while, right behind him, John Ross of Midwest CoCo Systems looks on. Dennis Kitsz (above right) of Green Mountain Micro sports the latest in (rain hats?). Designer/artist Paul S. Hoffman (background) was a seminar leader. The first East Coast RAINBOWfest had a record-setting attendance.

**Al Hartman (above left) mans a corner of Spectrum's exhibit while Paul Rosen peeks in on the action. John Fraysse (pointing) attracts a crowd at the Tom Mix booth. Curiosity, imagination and a new game program (top right) launch a flight of fancy carrying a young visitor far from the madding crowd.**



**Radio Shack used a giant screen TV to demonstrate their *Zaxxon* game (left). The seminars included this overflow session led by KISSable OS-9 columnist Dale Puckett (below left). Thanks to a strolling artist, RAINBOWfest body art! (below right)**

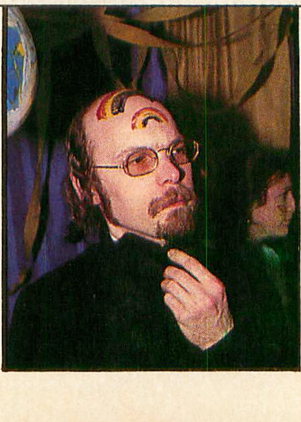
A record-setting crowd greeted exhibitors at RAINBOWfest-New Brunswick, March 30-April 1, even though the worst snow storm of the season had blasted the New York/New Jersey area just two days earlier, shutting down airports and threatening to cast a pall over the weekend get-together. But the weather broke and so did the fest's attendance record, barely edging out last year's Chicago show with more than 10,000 people converging on the Hyatt Regency.

While a violinist lulled the lobby crowd and a strolling artist painted rainbows on those in the waiting lines, it was a madhouse in the exhibit hall from beginning to end — but nowhere more frenzied than in the Green Mountain Micro booth where Dennis "I'll teach you a lesson . . ." Kitsz and his crew, appropriately dressed in white coats, maintained relentless revelry.

Seeking but not finding asylum at Tom "The King" Mix's booth was John "Crazy" Fraysse on hand to demo his latest brain-buster, Worlds of Flight, a realistic view-oriented flight simulator program. Meanwhile, Bob "Modem Mania" Rosen's assistants tried a power megaphone for crowd control, but seemed lost in the din. After all, where else but RAINBOWfest could you get a regularly $12.95 Spectrum remote reset for just 99¢! And when Radio Shack brought in a truckload of gray 16K Color Computers to close out at $99.95, it was "Bedlam."

Though the seminar rooms were packed, with hundreds attending, and often without even standing room available, things were a lot calmer and the sessions were highly rated by all reports we received. Our thanks to our seminar leaders: Steve Blyn, Bruce Cook, Susan and Gary Davis, Dan Eastham, Marty Goodman, Frank Hogg, Fred Scerbo, Dale Puckett, Richard Parry, Bob Rosen, Paul Hoffman and Frank Thompson.

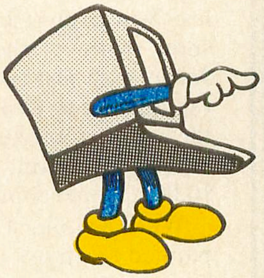
RAINBOWfest-New Brunswick, such a success that we've tentatively scheduled another RAINBOWfest for the same area this fall, at Princeton, N.J., September 28-30. In the interim, it's time to revisit the site of CoCo's very first show, the Hyatt Regency Woodfield in Chicago. This year's show will be June 22-24, and just may be another record-breaker.

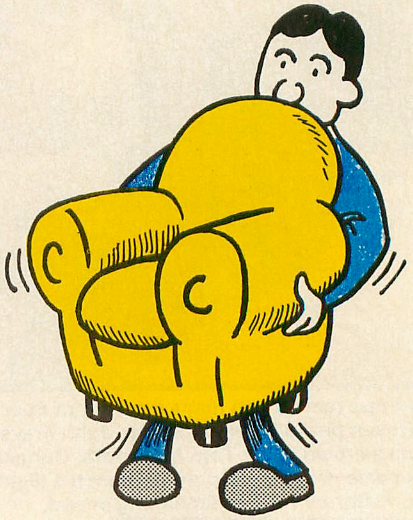


16K
ECB

# Your Very Own Interior Decorator

### By T.A. Fahlberg





*Room Layout,* which requires 16K Extended BASIC, will provide users with the ability to draw any room up to 15′ by 21′ and draw and locate any size rectangular or circular pieces of furniture she/he pleases. The reason I developed it was that I am currently moving to a somewhat smaller apartment. I have used it extensively to best locate the furniture before having to physically move it. It really beats trying to work with a drawing and paper cutouts. For those with more memory, it could be modified to include placing furniture at angles and providing for windows.

The program allows those individuals with graphics printing capability to obtain printouts which could be easily labeled and given to a mover if so desired. The program works as follows:

1) It tells the user to set up his printer for graphics printer if he desires printouts.

2) It asks for the room's maximum length and width. It gives instructions for drawing in terms of walls and openings, their direction and length in inches.

3) It keeps track of how the room is being drawn and does not allow the drawing to extend beyond established parameters.

4) After the room has been drawn, a display is shown. The computer then asks if the user is ready to position furniture.

5) The dimensions of each piece of furniture are requested and the instructions for its positioning are provided.

6) A dot is then shown in the middle of the screen, which can be moved to the location where the piece is to be drawn. You are not allowed to place a piece outside the room's boundaries.

7) After the piece has been placed, the computer asks if:

1) the piece is to be moved;
2) it is to be redrawn;
3) the user wants another one like it;
4) a different piece is desired.

8) Finally, the program asks if:

1) a printout is desired;
2) the user wants to relocate any piece;
3) she/he wants to try the room again from scratch;
4) a new room is to be drawn.

So, no more going through the usual exhausting moving, just turn on the CoCo because now you have your very own interior decorator

---

*(T.A. Fahlberg is a retired federal employee now residing in Boulder City, Nev. This is his first published computer program. He and his wife are now planning to take their Color Computer on a two-year trip in their new R.V.)*

| | | | |
|---|---|---|---|
| 90 | 238 | 3010 | 12 |
| 210 | 119 | 3200 | 171 |
| 380 | 52 | 6020 | 128 |
| 580 | 155 | 8020 | 239 |
| 1010 | 222 | END | 68 |

**The listing:**

```
10 CLS:PRINT@202,"ROOM LAY0UT":P
RINT:PRINT"        COPYRIGHT (C) 19
83 BY":PRINT:PRINT"           T.A.
 FAHLBERG"
20 FORO=1TO3000:NEXTO
30 CLS:PRINT:PRINT:PRINT"  IF YO
U WISH TO SAVE COMPLETED LAYOUTS
 WITH YOUR PRINTER YOU   MUST PR
ESS THE <BREAK> KEY, LOADYOUR SC
REEN PRINT PROGRAM AND   RESTART
 THIS PROGRAM.":INPUT "     PRESS
 <ENTER TO CONTINUE";A$
40 IF A$=CHR$(13)THEN50
50 PCLS:PMODE4,1:DEFUSR0=15785:D
```

# The best in software for kids!

## THE MONEY SERIES
BY STEVE BLYN

**DOLLARS & SENSE 16K ECB $14.95**
Player buys familiar items using dollars and coins to practice using money correctly.

**McCOCO's MENU 16K ECB $14.95**
Learn to buy and add up your purchases from a typical fast-food restaurant menu.

**MONEY-PAK 32K ECB $22.95**
A combined and menu driven version of the above programs. Includes play money. Reviewed - Rainbow 7/83

**FIRST GAMES** by Penny Bryan
32K EB. tape $24.95 disk $27.95
First Games contains 6 menu-driven programs to delight and teach your early learners (ages 3-6). These games enrich the learning of colors, numbers, lowercase letters, shapes, memory, visual discrimination and counting.

NEW

**ARROW GAMES** (preschool games)
32K EB tape $21.95 disk $24.95

**COLORGRADE 32K ECB $29.95**
A great aid to teachers. Records and calculates grades for up to 6 classes of up to 40 students each. Uses number or letter grades, named or numerical periods and gives a weighted average. Easy to use. Full directions. DISK ONLY. By David Lengyel.

New

**BEYOND WORDS 32K ECB $19.95 Each**
These Language Arts programs cover common misspellings, and synonyms/-antonyms on each level. Additionally, Level 1 tests contractions and abbreviations, Level 2 tests homonyms, and Level 3 tests analogies. Each program has 3 parts and contains over 400 questions and uses over 800 words. All tests are grade appropriate. User modifiable (directions included). Printer option.

Level 1 Grades 3-5
Level 2 Grades 6-8
Level 3 Grades 9-12
DISK VERSION Each $23.95

**KING AUTHOR'S TALES** by Steve Blyn
32K EB. disk or 16K EB. tape $29.95
An exciting new program that allows users to create and save original stories on files. Saves optional questions and answers for each page, and title page picture, too. Kids can write compositions, teachers/parents can create reading comprehension material. Rewrite, correction, review, and printer features. Includes a selection of stories and pictures.

**MATH INVADERS** by David Steele
16K EB. $17.95
A multi-level 'Space Invaders' type game to reinforce the 4 basic math operations (addition, subtraction, multiplication and division). Problems become more difficult as you progress. Hi-res. graphics, joystick required.

**THE MATH TUTOR SERIES 16K Ext.**
These tutorials take the child through each step of the example. All programs include HELP tables, cursor and graphic aids. All allow user to create the example, or let the computer choose. Multi-level. Great teaching programs. By Ed Guy.

| | |
|---|---|
| LONG DIVISION TUTOR | $14.95 |
| MULTIPLICATION TUTOR | $14.95 |
| FACTORS TUTOR | $19.95 |
| FRACTIONS TUTOR (Addition) | $19.95 |
| FRACTIONS TUTOR (Subtraction) | $19.95 |
| FRACTIONS TUTOR (Multiplication) | $19.95 |
| Any 2 FRACTIONS programs | $29.95 |

NEW

EQUATIONS TUTOR 32K EB $19.95
ARITHMETIC DIAG. DISK 32K $49.95
FRACTIONS DIAG. DISK 32K $49.95

**THE QUIZ MAKER** by David Stanley
32K EB. tape $24.95 disk $27.95
A program that enables a teacher to create tests or a student to study for tests in any subject area. Your questions and answers may be saved for future use. Short answer, true-false, fill-in and other quiz formats are supported. Printer option for hard copy test generation. Program randomizes questions, keeps track of score and provides a variety of testing formats.

## MORE LEARNINGWARE
(ALL PROGRAMS IN 16-K EXTENDED EXCEPT WHERE NOTED)

**CONTEXT CLUES** - by Steve Blyn - Multiple choice reading programs. Specify grade 4,5,6 or 7. each $17.95

**VOCABULARY BUILDERS** - 32K - Great for test preparations. 200 questions, multiple choice, modifiable, printer option. I (grades 3-5), II (6-8) or III (9-12) each $19.95

**HISTORY GAME**-32K-by J. Keeling-"Jeopardy" type US facts game $14.95

**KNOW YOUR STATES**-32K-by J.Keeling-Name all hi-res. states $19.95

**MUSIC DRILL** - by D.Steele - Identify notes of many scales. $19.95

**GRAPH TUTOR** - 32K - by C. Phillips - Create, use line, bar, pie pictographs. Hi-res $19.95

**PRESCHOOL SERIES** - By J. Kolar. each $11.95
Pre. 1-Counting, number recognition; Pre. 2 - Simple Addition; Pre. 3 - Alphabet Recognition.

**GRAPH-IT** - by D.Steele - Graph sets of algebraic equations. $14.95

**FRENCH OR SPANISH BASEBALL** - By S. Blyn each $11.95
Vocabulary practice. 200 words. Modifiable. Specify language. Also in 32K (500 words) $19.95

**HEBREW BULLETIN BOARD**-by J.Kolar-utility to print words. $15.95

## FUN and GAMES
(ALL PROGRAMS IN 16-K EXTENDED EXCEPT WHERE NOTED)

**CIRCUS ADVENTURE**-by Steve Blyn 16K-Kids adventure game. $11.95

**SCHOOL MAZE** - by Steve Blyn 16K - Kids graphic adventure. $11.95

**HAMSTER HUNT** - by L&D Weston 32K - Beautiful graphics in this charming new kids adventure game. $19.95

**MR. COCOHEAD** - by Steve Blyn - Create over 10,000 funny faces. Surprise-commands. Very creative. $16.95

**HORSERACE** - by R&P Armstrong - Hi-res. race for all ages. $11.95

RAINBOW
CERTIFICATION
SEAL
Dealers inquiries invited.

Computer Island

**FOR YOUR CONVENIENCE**

| | |
|---|---|
| Blank Cassettes with Labels | 3 For $ 2.00 |
| Popular Brand Diskettes | 3 For $10.00 |
| Disk Head Cleaner Kit | each $25.00 |
| Looseleaf Diskette File (hold 4) | 2 For $ 3.00 |

(212) 948-2748
Dept. R 227 Hampton Green, Staten Island, N.Y. 10312
Send for catalog with complete descriptions.

Please add $1.00 per order for postage. N.Y. residents, please add proper tax. FREE set of BINARY DICE, including full directions, with orders of 2 or more items
Authors: We are seeking quality children's software for leisure or learning. Write for details. Top Royalties.
TRS-80 Color Computer. TDP System 100.

```
IM X(25),Y(25),D$(25)
60 CLS:PRINT@40,"DRAW ROOM LAYOU
T"
70 CLS:PRINT:PRINT"  MEASURE YOU
R ROOM CLOCKWISE   STARTING WITH
 THE LONGEST WALL.   WHERE THERE
 IS A DOOR OR AN   OPENING MEASU
RE THE DISTANCE TO IT AND ITS WI
DTH."
80 PRINT:INPUT"  HOW LONG IS THE
 LONGEST WALL? ENTER NUMBER IN I
NCHES AND PRESS<ENTER> KEY.";WWE
DIT 100
90 PRINT:INPUT"  HOW LONG IS THE
 LONGEST WALL  IN THE OPPOSITE D
IRECTION? ENTERNUMBER AND PRESS<
ENTER>KEY";LL
100 XL=INT((255-WW)/2):YU=INT((1
91-LL)/2)
110 CLS:PRINT:PRINT"  YOU WILL B
E ASKED IF YOU WISH TO DRAW A WA
LL OR AN OPENING ANDIT'S DIRECTI
ON AND DISTANCE.":PRINT:PRINT"
START AT THE LEFT CORNER OF    TH
E LONGEST WALL AND DRAW CLOCK-WI
SE OR COUNTER CLOCKWISE AROUNDTH
E ROOM."
120 PRINT:PRINT"    PRESS ANY KEY
 TO CONTINUE."
130 A$=INKEY$:IFA$=""THEN130
140 X=XL:Y=YU:I=1
150 PRINT:PRINT" AFTER YOU HAVE
FINISHED DRAWINGYOUR ROOM PRESS
THE<ENTER> KEY."
160 PRINT:PRINT"  WALL OR OPENIN
G?":PRINT"      FOR WALL PRESS
  'W'":PRINT"      FOR OPENING PR
ESS  'O'"
170 C$=INKEY$:IFC$=""THEN170
180 IFC$="W"ORC$="O"ORC$=CHR$(13
)THEN190ELSE170
190 IF C$=CHR$(13)THEN380
200 PRINT:PRINT"  WHAT DIRECTION
?":PRINT"      TO GO RIGHT PRESS
 'R'":PRINT"      TO GO LEFT PRES
S    'L'":PRINT"      TO GO DOWN P
RESS    'D'":PRINT"      TO GO UP
PRESS      'U'"
210 A$=INKEY$:IFA$=""THEN210
220 IFA$="R"ORA$="L"ORA$="D"ORA$
="U"THEN230ELSE210
230 D$(I)=C$
240 PRINT:INPUT" HOW MANY INCHES
 DO YOU WANT THECOMPUTER TO DRAW
 FOR YOU? ENTER NUMBER AND PRESS
<ENTER>.";A
250 IFA$="L"THENX(I)=X-A:Y(I)=Y
260 IFA$="R"THENX(I)=X+A:Y(I)=Y
270 IFA$="D"THENY(I)=Y+A:X(I)=X
280 IFA$="U"THENY(I)=Y-A:X(I)=X
290 IFX(I)=>XA THENXA=X(I)
300 IFY(I)=>YA THENYA=Y(I)
310 CLS:PRINT:PRINT"YOU ARE ";X(
I)-XL;"INCHES RIGHT.";ABS(X(I)-(
XL+WW));"      INCHES ARE LEFT.":
PRINT"YOU ARE ";Y(I)-YU;"INCHES
DOWN.";ABS(Y(I)-(YU+LL));"       I
NCHES ARE LEFT.":GOSUB1000
320 X=X(I):Y=Y(I):I=I+1:GOTO150
330 CLS:PRINT:PRINT:PRINT"  IF Y
OU WANT TO SEE YOUR ROOM  AGAIN
PRESS <ENTER>.":PRINT:PRINT"  IF
 YOU WANT TO REDRAW THE ROOMPRES
S 'R'.":PRINT:PRINT"  IF YOUR RE
ADY FOR FURNITURE    PRESS 'F'."
340 F$=INKEY$:IFF$=""THEN340
350 IFF$=CHR$(13)THEN380
360 IFF$="R"THENPCLS:GOTO110
370 IFF$="F"THEN470
380 SCREEN1,1
390 LINE(0,0)-(XL,YU),PRESET
400 D$(I)="":X(I)=0:Y(I)=0
410 FORII=1TO(I-1)
420 IFD$(II)="W"THENLINE-(X(II),
Y(II)),PSET
430 IFD$(II)="O"THENLINE-(X(II),
```

## POKES, PEEKS 'N EXECS

Here is the exhaustive file YOU HAVE BEEN WAITING FOR! Contains OVER 150 Pokes, Peeks & Execs with full explaination on use for each. BREAK-KEY disable, Reset Disables, LIST, LLIST & DIR disables. Commands for Cassette, Disk & Printer and MUCH MUCH MORE! BONUS: A Tape-To-Disk copy program .. ONLY $8.00

## HIDE-A-BASIC

A perfect utility to protect your basic programs with 4 ML routines to disable LIST, BREAK-KEY, RESET and create an ONERR GOTO routine. 16K EXT. BASIC TAPE-$11.95

## ALPHA-DIR

Arrange your DISK directory in alphabetical order.
16K ECB. TAPE $6.95 ................DISK — $14.95

## COLOR PAD

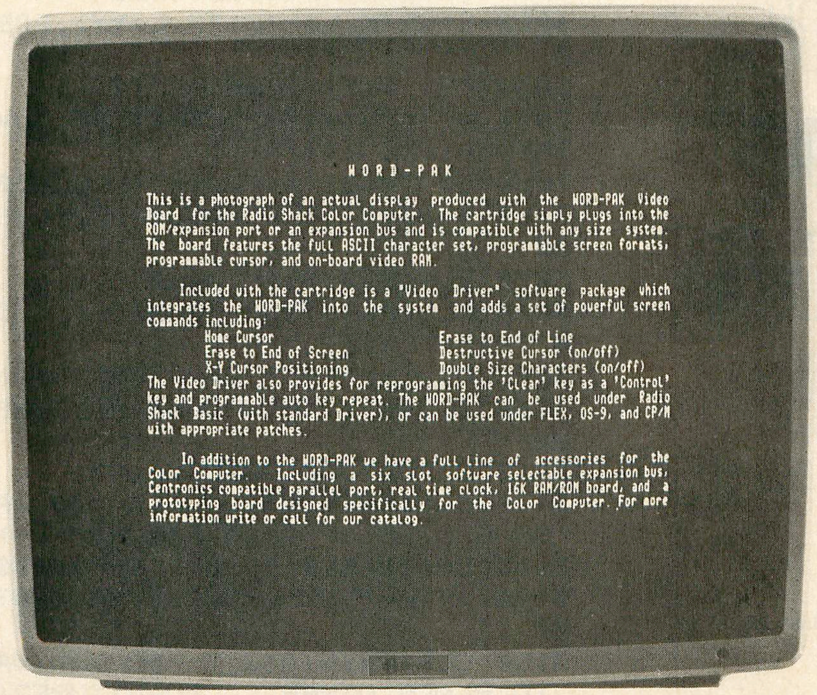
Enhance your artistic capabilities. Draw anything from planes to landscapes. Create dazzling patterns. Edit, paint, erase & save to tape or disk. BONUS: Airplanes Color Sketch Book Program. 16K ECB. No Joystks req.
TAPE - $16.95 ........................ DISK - $19.95

**ORDER TODAY!** Check, MO, COD ($2.50). Add $1.50 for S & H. NYS res. please add sales tax.

AJF MICROCOM SOFTWARE
P.O. BOX 214, FAIRPORT, N.Y. 14450
(716) 425-1824
VISA
Dealers Inquiries invited
master charge

```
Y(II)),PRESET
440 NEXTII
450 FORO=1TO4000:NEXTO
460 GOTO330
470 R=0:PI=0:CLS:PRINT@39,"DRAW
THE FURNITURE"
480 PRINT:PRINT"IS THE PIECE REC
TANGULAR?(Y/N)"
490 A$=INKEY$:IFA$=""THEN490
500 IF A$="Y"THEN550
510 PRINT:PRINT"IS THE PIECE CIR
CULAR?(Y/N)"
520 A$=INKEY$:IFA$=""THEN520
530 IFA$="Y"THENPI=1:PRINT:INPUT
"  PUT IN ITS DIAMETER IN INCHES
 AND PRESS<ENTER>.";DI:XX=DI:YY=
DI:GOTO740
540 PRINT:PRINT"I CAN'T DRAW IT
UNLESS IT IS A  RECTANGLE OR A C
IRCLE":FORI=1TO1500:NEXTI:A$="":
GOTO 470
550 PRINT:PRINT"PUT IN IT'S WIDT
H IN INCHES AND PRESS <ENTER>":I
NPUTXX
560 PRINT:PRINT"PUT IN IT'S DEPT
H IN INCHES AND PRESS <ENTER>":I
NPUTYY
570 IFXX<5ORYY<5THENSOUND128,10:
PRINT:PRINT"    ";XX;"BY";YY;"IS
AWFUL SMALL.          SURE YOUR
RIGHT? (Y/N)";ELSE600
580 Z$=INKEY$:IFZ$=""THEN580
590 IFZ$="Y"THEN600ELSE470
600 A$="":AA$="":AB$="":AC$="":C
LS:PRINT@35,"PUT THE PIECE IN TH
E ROOM"
610 PRINT:PRINT"        TO DRAW IT
      PRESS"
620 IFPI=1THENGOSUB6000:GOTO2000
630 PRINT:PRINT"RIGHT WALL RIGHT
         R"
640 PRINT"LEFT WALL LEFT
     L"
650 AA$=INKEY$:IFAA$=""THEN650
660 IFAA$="R"ORAA$="L"THEN670ELS
E650
670 PRINT:PRINT"UP
          U"
680 PRINT"DOWN
       D"
690 AB$=INKEY$:IFAB$=""THEN690
700 IFAB$="U"ORAB$="D"THEN710ELS
E690
710 PRINT:PRINT"HORIZONTALLY
         H":PRINT"VERTICALLY
            V"
720 AC$=INKEY$:IFAC$=""THEN720
730 IFAC$="H"ORAC$="V"THEN740ELS
```

A PICTURE IS WORTH . . .



W O R D - P A K

This is a photograph of an actual display produced with the WORD-PAK Video Board for the Radio Shack Color Computer. The cartridge simply plugs into the ROM/expansion port or an expansion bus and is compatible with any size system. The board features the full ASCII character set, programmable screen formats, programmable cursor, and on-board video RAM.

Included with the cartridge is a "Video Driver" software package which integrates the WORD-PAK into the system and adds a set of powerful screen commands including:

Home Cursor — Erase to End of Line
Erase to End of Screen — Destructive Cursor (on/off)
X-Y Cursor Positioning — Double Size Characters (on/off)

The Video Driver also provides for reprogramming the 'Clear' key as a 'Control' key and programmable auto key repeat. The WORD-PAK can be used under Radio Shack Basic (with standard Driver), or can be used under FLEX, OS-9, and CP/M with appropriate patches.

In addition to the WORD-PAK we have a full line of accessories for the Color Computer. Including a six slot software selectable expansion bus, Centronics compatible parallel port, real time clock, 16K RAM/ROM board, and a prototyping board designed specifically for the Color Computer. For more information write or call for our catalog.

see us at RAINBOWfest CHICAGO

PBJ inc.
P.O. BOX 813
N. Bergen, N.J. 07047
(201) 330-1898

MASTER DESIGN
(C) 1984 By Derringer Software, Inc.

DOES MORE THAN JUST DRAW PICTURES

IT'S A TEXT DESIGNER

Master Design has the ability to generate lettering in the graphics mode from sizes 2 to 32 and in a wide range of styles. Size 2 offers a 42 x 22 line format while size 32 creates letters that take up over half the screen. Lettering can be skinny, bold, textured, tall, drop shadow, raised shadow and in different thickness. There's nine different settings for thickness and nine different settings for creating open lettering.

IT'S A GRAPHICS EDITOR

Take full advantage of hi-res commands including GET, PUT, CIRCLE, PCOPY, PMODE, LINE, BOX, BOX FILL, PAINT and other special features available only with Master Design. Master Design utilizes a "two cursor" concept to allow quick formatting of boxes, lines and special patterns such as dot patterns for shading and diagonal, vertical or horizontal lines for creative backgrounds. You can create designs and use the TEXT designer to label areas or place titles. You can also create mirror images of the display.

COMES WITH A SCREEN PRINT ROUTINE

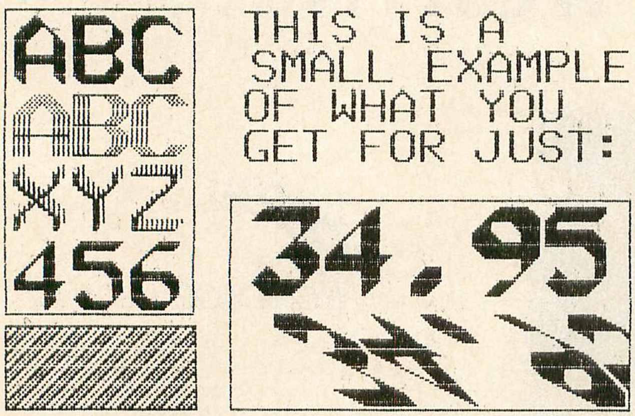
Master Design comes with a 7 bit and 8 bit version of a hi-res screen print routine so no matter what your printer is, we have it covered. Works in any pmode and can print normal or reversed images.

DISK and CASSETTE I/O

Save and load your creations to and from disk or cassette. You can even load hi-res displays created by other programs to make changes.

INTERFACES WITH TELEWRITER-64

Wouldn't it be nice if you could design your own letter head in hi-res graphics and then print it out while using Telewriter-64? Master Design offers just that capability! The Letter Head Utility will let you convert any hi-res display so that it can be accessed while using Telewriter-64! The BASIC program modules are provided with step by step instructions. These BASIC modules can also be used in your own BASIC programs for printing displays without having to use the graphic pages. You can have upto 88 pages of graphics linked together for printing!


ABC
ABC
XYZ
456
THIS IS A SMALL EXAMPLE OF WHAT YOU GET FOR JUST:
34.95

DERRINGER SOFTWARE INC. ™

see us at RAINBOWfest CHICAGO

Send Check or Money Order to:
Derringer Software, Inc.,
P. O. Box 5300
Florence, S. C. 29502-2300

Visa/MC customers can call: (803) 665-5676 — 9:00 - 5:00 edt

Requires 32K with at least one disk drive
(Include $2.00 for shipping and handling)

Telewriter-64 (C) 1983 by Cognitec

```
E720
740 IFTI=0THENGOSUB6000:TI=1
750 GOTO 2000
1000 IFX(I)<XL THEN1050
1010 IFXA>(XL+WW)THEN1050
1020 IFYA>(YU+LL)THEN1050
1030 IFY(I)<YU THEN1050
1040 RETURN
1050 SOUND128,5:CLS:PRINT:PRINT"
 YOUR OUTSIDE YOUR ESTABLISHED
BOUNDARIES. PRESS 'S' TO SHORTEN
YOUR LAST LINE OR PRESS <ENTER>
TO REDRAW THE ROOM."
1060 B$=INKEY$:IFB$=""THEN1060
1070 IFB$="S"THENX(I)=X(I-1):Y(I
)=Y(I-1):XA=X(I):YA=Y(I):GOTO150
1080 IFB$=CHR$(13)THEN60ELSE1060
2000 K=127:L=95:SCREEN1,1:PSET(K
,L)
2010 C$=INKEY$:IFC$=""THEN2010
2020 IFC$=CHR$(8)THENK=K-2:PSET(
K,L,5):PRESET(K+2,L):IFK=<XL THE
NK=K+2:GOTO2010
2030 IFC$=CHR$(9)THENK=K+2:PSET(
K,L,5):PRESET(K-2,L):IFK=>(XL+WW
)THENK=K-2:GOTO2010
2040 IFC$=CHR$(10)THENL=L+2:PSET
(K,L,5):PRESET(K,L-2):IFL=>(YU+L
L)THENL=L-2:GOTO2010
2050 IFC$=CHR$(94)THENL=L-2:PSET
(K,L,5):PRESET(K,L+2):IFL=<YU TH
ENL=L+2:GOTO2010
2060 IFC$=CHR$(13)THEN3000
2070 GOTO 2010
3000 IFPI=1THENR=DI/2:GOSUB5000:
GOSUB8000:CIRCLE(K,L),R:GOTO3030
3010 GOSUB8000:GOSUB5000
3020 LINE(K,L)-(K+XX,L+YY),PSET,
B
3030 FOR T=1TO2500:NEXTT
3040 CLS:PRINT@32,"WANT TO MOVE
THIS PIECE? (Y/N)"
3050 D$=INKEY$:IFD$=""THEN3050
3060 IFD$="Y"THENGOSUB4000ELSE30
80
3070 GOSUB7000:GOTO600
3080 CLS:PRINT@64,"WANT TO REDRA
W THIS PIECE?(Y/N)"
3090 D$=INKEY$:IFD$=""THEN3090
3100 IFD$="Y"THENGOSUB4000ELSE31
20
3110 GOSUB7000:GOTO470
3120 CLS:PRINT@32,"  DO YOU WANT
 SOME MORE OF THIS PIECE?(Y/N)"
3130 D$=INKEY$:IFD$=""THEN3130
3140 IFD$="Y"THENGOSUB7000:GOTO6
00
3150 CLS:PRINT@32,"  DO YOU WANT
 TO PLACE OTHER    FURNITURE?(Y/
N)"
3160 D$=INKEY$:IFD$=""THEN3160
```

## GRAPHICOM

The hit of the Pasadena Color Expo, GRAPHICOM is the best graphics program ever written for the COCO! GRAPHICOM was three years in the making, and you can see every minute in its quality and ease of use. GRAPHICOM has features you would expect from systems costing hundreds of times more!

**Powerful drawing tools: "rubber band" graphics, "stamps", rotating pictures, mirrored, masked, and reversed images, and lots more!

**Easy to use: Uses two joysticks, or one joystick and koala pad, to operate a big, simple picture-based menu.

**Incredible output capacity: Transmit pictures over modems or ameteur radio! GRAPHICOM even has a screen dump function that works with over 20 different printers!

GRAPHICOM is simple enough that anyone can use it, yet it's so powerful that a seasoned artist can use it to explore new frontiers of creativity.

Requires 64K and disk drive ....... Only $29.95

### ART MAN: THE POOR MAN'S GRAPHICOM?

ART MAN has a remarkable resemblence to GRAPHICOM; they're almost the same! The biggest difference is that ART MAN will run on a 32K system! Tape or Disk .................... $29.95

### GRAPHICOM PICTURE DISKS

Marvel at the wonders of computer aided art with the amazing gallery of picture disks for use with GRAPHICOM:

Picture Disk #1: Features drawings, and tutorials for GRAPHICOM.

Disk #2: Features Elvira, mistress of the dark, and friends (great drawings and digitized photos).

Disk #3: Excellent drawings, tutorials, and examples of use of the "X-PAD".

Disk #4: Electronic circuits and symbols.

GRAPHISET - More than 16 font screens: Roman, Greek, Cursive, special symbols and more!

Picture Disks are $19.95 for one, and $10.00 for each additional disk, or $39.95 for all five.

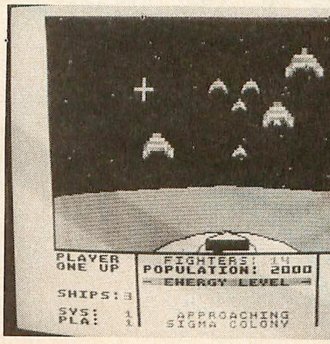
### NEWBASIC

This impressive package will save you hundreds of tedious hours trying to do those "impossible" little things in BASIC. NEWBASIC adds over 30 commands to regular BASIC: expanded directory, text "window", inverse video, keyboard click, BREAK on or off, underline, word "wrap", ten definable function keys, ON ERROR GOTO, text screen dump, a function to help you type in programs from RAINBOW magazine, and MUCH, MUCH MORE!

Requires 64K and disk drive ............ $49.95

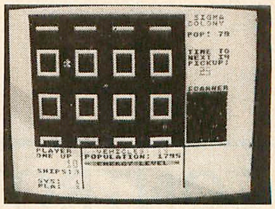
## INTERCEPT 4

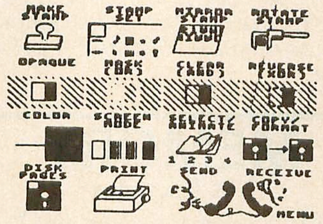
By J. Weaver, Jr.


PLAYER ONE UP
FIGHTERS: 14
POPULATION: 2000
ENERGY LEVEL
SHIPS: 3
SYS: 1
PLA: 1
APPROACHING SIGMA COLONY

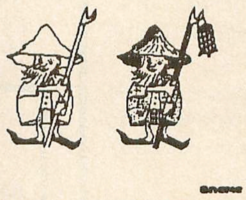
Your ship and the planet are under attack. Hostile alien craft whip around the ship, releasing flamming bolts of energy upon the hull of the INTERCEPT. Immediately your own guns come alive, warding off the sudden attackers, but will it be enough? Already many of the fighters have escaped past your ship toward the defenseless colonies below. Once the air battle is over, you must transport down to the planet, try to find the alien foe, and destroy them. Then, the hardest task awaits: using the full power of the INTERCEPT, you must battle and destroy the mother ship!! Three separate screens or levels of play. Each screen scrolls in all four directions. A fantastic new game by the author of Outhouse. Requires two joysticks.

32K ................................ $27.95/29.95

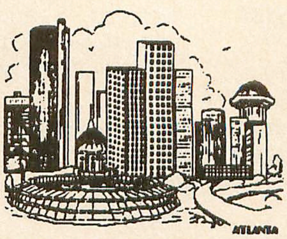

SIGMA COLONY
POP: 79
TIME TO NEXT PICKUP:
SCANNER
PLAYER ONE UP
VEHICLES:
POPULATION: 1795
ENERGY LEVEL
SHIPS: 3
SYS:
PLA:


MAKE STAMP
STAMP SET
MIRROR STAMP
ROTATE STAMP
OPAQUE
MASK COPY
CLEAR CARDS
REVERSE CARDS
COLOR
SCREEN MODE
SELECT/ROTATE
COPY/FORMAT
DISK PAGES
PRINT
SEND
RECEIVE
MENU

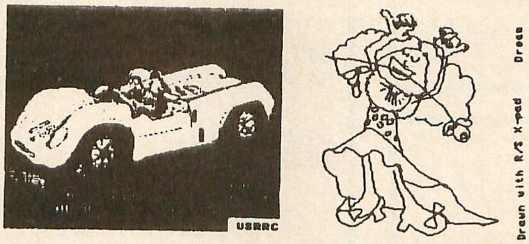
GRAPHICOM MENU



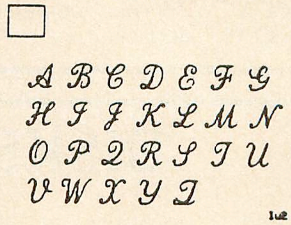
FROM PICTURE DISK #1



FROM PICTURE DISK #2


USRRC
Drawn with R/S X-pad
Drees

FROM PICTURE DISK #3


A B C D E F G
H I J K L M N
O P Q R S T U
V W X Y Z

FROM GRAPHISET

COUPON

**$10** **$10**

This coupon is good for $10 off any order that is for more than $35.00 (Note: only one discount per order)

This coupon is good on mail order or phone in orders. But you must ask for discount at time or order.

**$10** **$10**

see us at RAINBOWfest CHICAGO

MichTron

6655 Highland Road • Pontiac, MI 48054
Orders & Information (313) 666-4802

Master Charge and VISA OK. Add $3.00 for shipping in the USA - $5.00 in Canada. Dealer Inquires invited.

# 202,752 BYTES EXTRA*

# $44.44

# MORE

see us at RAINBOWfest CHICAGO

**Drive 0 Package $444.39**

DD-2 DSDD Drive
DC-1 40 Track Controller
CA-1 Cable

## CONTROLLERS

| | |
|---|---|
| **DC-1**<br>**$134** | ROM disk controller reads & writes to 35 and 40 track single and double sided drives with all models of the color computer (J&M) |
| **VC-1**<br>**$24.45** | Video interface mounts inside color computer by piggybacking IC on top of interface–no soldering and no trace cuts |
| **VC-2**<br>**$26.45** | for color computer 2 – monochrome only |
| **VC-3**<br>**$39.45** | for color computer 2 – color and monochrome |

## DISKS

| | |
|---|---|
| **DD-1**<br>**$269** | ½ height 5¼" 40 Track SSDD 179,712 bytes available |
| **DD-2**<br>**$319** | ½ height 5¼" 40 Track DSDD 359,424 bytes available |
| **DD-3**<br>**$449** | Dual 3" 40 Track SSDD 359,424 bytes available (Amdek) |
| **CA-1**<br>**$24.44** | Cable to connect disk to controller |

**Drive 0 needs controller DC-1 above**

*The Howard drive 0 package gives 359,424 bytes of available storage for $444.39 using our double sided, double density disk and 40 track controller. The regular 35 track drive 0 gives 156,672 bytes for $399.95. The Howard package gives an extra 202,752 bytes for $44.44 more.

## MEMORY

### 64K Upgrades

| | |
|---|---|
| **64-E1**<br>**68.45** | for E Boards. Remove old Chips and replace with this preassembled package - No soldering or trace cuts |
| **64-F1**<br>**64.45** | for F Board. Preassembled with no soldering. Capacitor leads must be cut |
| **64-2**<br>**69.45** | for color computer 2. Kit requires soldering, no traces to cut. |

## PRINTER

| | |
|---|---|
| **RX-80**<br>**$324** | Epson pin feed |
| **SC-1**<br>**$65.00** | Serial to parallel interface<br>Includes all cables |

Any product may be returned within 30 days for refund if not satisfied.

We handle all warranty & repair work thru our direct contact with the manufacturer.

## MONITORS

| | |
|---|---|
| **122**<br>**$134** | Zenith 12" Amber gives excellent resolution and is easy on the eyes |
| **123**<br>**$114** | New Zenith green screen for serious programmers and word processing |
| **131**<br>**$334** | 13" Color monitor with speaker, composite, and RBG jack (Zenith) |

**All Monitors need video controller**

## TV STANDS

| | | COCO 2 |
|---|---|---|
| **TS-1**<br>**$29.50** | 15W x 11D x 4H<br>for 13" screen | **TS-2**<br>**$29.50** |
| **TS-4**<br>**$39.50** | 24W x 11D x 4H<br>for 19" screen | **TS-3**<br>**$39.50** |
| **PS-1**<br>**$19.95** | 18W x 15D x 2½H<br>for all popular printers<br>add $5 for bottom feed slot | |

TV stands come with ROM pack cut-out. Specify ivory or smoked grey.

please send me the following

Name ______________________

Address ______________________

City, State Zip ______________________

| Cat. # | Description | Cost |
|---|---|---|
| _____ | ______________ | ________ |
| _____ | ______________ | ________ |
| _____ | ______________ | ________ |
| | Shipping | ________ |
| | Ill. residents add tax | ________ |
| | Total | ________ |

VISA MasterCard AMERICAN EXPRESS

**Howard Medical**

Box 2, Chicago, 60690
312 944-2444

RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
GAME ISSUE

# The Biggest

# The Best

RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
DATA COMMUNICATIONS

# The Indispensable

# The RAINBOW

It's called the *premier Color Computer magazine* for good reason. **The Rainbow** is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! Is there any wonder we get letters daily which praise **the Rainbow**, the magazine one reader calls "A Pot Of Gold" for his Color Computer?

**The Rainbow** features more programs, more information and more in-depth treatment of the TRS-80 Color, TDP System-100, MC-10 and Dragon-32 and 64 computers than anyone else.

*Each* monthly issue is well over 320 pages and contains more than two dozen programs, some 15 regular columns and 30 or more product reviews. And advertisements: **the Rainbow** is known as *the* medium for advertisers—which means every month it has a wealth of information unavailable anywhere else about new products! More than 200 companies advertise in its pages every month.

But what makes **the Rainbow** is its people. People like Bob Albrecht, the master teacher of computer programming. People like Don Inman, one of the world's best computer graphics authors. Experts like Dick White, one of the most knowledgeable writers about BASIC. Or, Dan Downard, **Rainbow** technical editor, who answers our readers' toughest questions. Educators like award-winning **Rainbow** columnist Steve Blyn. Advanced programmers like Dale Puckett, who guides you through Radio Shack's OS-9 operating system. Electronics specialists like Tony DiStefano, who explains the "insides" of the CoCo. These people, and many others, visit you monthly through columns available only in **the Rainbow.**

Special programs on using *Spectaculator.* An income tax reporting system. Complete Adventure games and Simulations. **The Rainbow's** unique *Scoreboard* of arcade games. And games—lots of them—super graphics and utilities, the world's first four-color computer magazine centerfold! And much, much more.

Join the tens of thousands who have found **the Rainbow** to be the absolute necessity for their CoCo. With all this going for it, is it surprising that more than 95 percent of **the Rainbow** subscribers renew their subscriptions?

We're willing to bet that, a year from now, you'll be doing the same. For more information call (502) 228-4492.

## Get Your Very Own Pot O' Gold!

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year! A subscription to **the Rainbow** is only $28* and you won't miss a single chock-full issue.

As the premier magazine for the TRS-80 Color, TDP-100 and Dragon-32 and -64 computers, **the Rainbow** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to **the Rainbow** today!

We accept VISA, MasterCard and American Express. Non-U.S. rates higher. U.S. currency only, please.

*YES!* Sign me up for a year (12 issues) of **the Rainbow.**

☐ *NEW* ☐ *RENEW (Attach Label)*

*Name* ________________

*Address* ________________

*City* ________ *State* ________ *ZIP* ________

☐ Payment Enclosed

Charge ☐ VISA ☐ MasterCard ☐ American Express

Account Number ________________

Signature ________ Card Expiration Date ________

MasterCard VISA American Express Cards Welcome

*Subscriptions to **the Rainbow** are $28 a year in the United States. Canadian and Mexican rate is $35 U.S. funds. Surface rate elsewhere is $65 U.S. funds. Air mail is $100 dollars U.S. funds. All Subscriptions begin with the current issue. Please allow 5-6 weeks for the first copy.

## Rainbow On Tape Tops Typing

Tired of spending all your valuable computer time typing in those long, but wonderful, **Rainbow** programs each month? Now there is **Rainbow On Tape** to help ease the pain.

Each month all the lengthy programs (over 20 lines) in **the Rainbow** can come to you ready-to-run, thanks to **Rainbow On Tape**. More than 20 programs every month in all! At $70* per year — or $8 a tape** — it is the biggest bargain going.

Back issues are available beginning with April, 1982 (except May 1983). Each month's tape will arrive approximately the same time as your current month's issue of **the Rainbow**.

YES! Sign me up for the biggest bargain going . . . **Rainbow On Tape!**

☐ *NEW* ☐ *RENEW (Attach Label)*
☐ *A Full Year* ☐ *A Month (Specify Month & Year* ____________*)*

*Name* ________________

*Address* ________________

*City* ________ *State* ________ *ZIP* ________

☐ Payment Enclosed

Charge ☐ VISA ☐ MasterCard ☐ American Express

Account Number ________________

Signature ________ Card Expiration Date ________

MasterCard VISA American Express Cards Welcome

*Subscriptions to **Rainbow On Tape** are $70 in the United States, $80 U.S. funds in Canada and Mexico and $95 U.S. funds in all other countries.

**Back issues of the tapes are $8 in the United Staes, $10 U.S. funds for Canada, Mexico and all other countries.

**BUSINESS REPLY CARD**
First Class PERMIT No. 1 Prospect, KY
POSTAGE WILL BE PAID BY ADDRESSEE

**RAINBOW**
**P. O. Box 209**
**Prospect, KY 40059**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

**BUSINESS REPLY CARD**
First Class PERMIT No. 1 Prospect, KY
POSTAGE WILL BE PAID BY ADDRESSEE

**RAINBOW**
**P. O. Box 209**
**Prospect, KY 40059**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

# What goes well with *the Rainbow?*

RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
FOCUS ON EDUCATION
CoCo Breakthrough!
The RAINBOW
on tape

# *Rainbow On Tape!*

We call it the other side of *the Rainbow,* and we may have to raise the price just to call your attention to it. With more than two dozen programs every month, ***Rainbow On Tape*** is a luxury service at a bargain basement price. At $6.50 for a single copy, that's only 27¢ a program. And, with a full year's subscription, for $60, we're practically giving it away.

What is it? ***Rainbow On Tape*** is a monthly, cassette tape adjunct to *the Rainbow* and it's brimming with all the programs (those over 20 lines long) that fill the pages of the magazine. All you do is pop the cassette in your tape recorder and they're ready to run. No more lost weekends —or weeknights — typing, typing, typing. With ***Rainbow On Tape***, you must read the article in the magazine then, in seconds, you load it up and run it.

Yes, ***Rainbow On Tape*** is brimming with the programs that fill *the Rainbow's* pages each month. And, yes, you could type them in yourself, as many people do. But all of them? Every month? There simply isn't enough time.

Isn't it time your CoCo became a fulltime computer instead of a typewriter. Think how your software library will grow. With your first year's subscription, you'll get almost 300 new programs: games, utilities, business programs, home applications — the full spectrum of *the Rainbow's* offerings without the specter of keying in page after page and then debugging.

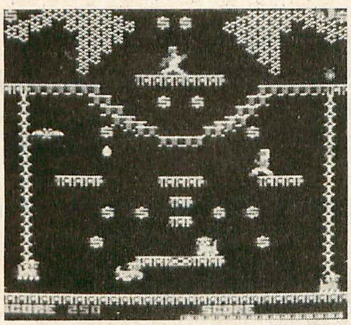
***Rainbow On Tape*** — the "meat" of *the Rainbow* at a price that's "small potatoes." Food for thought. To get your first heaping helping, just fill out and return the attached reply card. No postage necessary.

Discover the other side of *the Rainbow*. It's not only a time-saver, it's the key to a whole new outlook!

# CASH MAN

*By Bill Dunlevy & Doug Frayer*

Exploding with color, racing with fast animation, and roaring with sound, this great non-violent game is destined to be a classic! The review in February's issue of RAINBOW says this: "A Fun Investment" "it is totally unique" "I found it very tough to tear myself away from playing the game long enough to write about it! In short, CASHMAN is one fun game. Buy it."



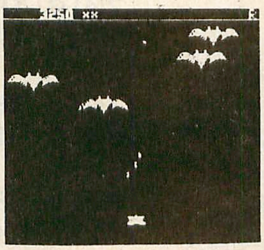
Dozens of levels and screens (more than FORTY!) offer anyone, from beginner to expert, as much good clean fun as they want! Higher levels include special Mystery Pieces and Expert Puzzle Pieces and Expert Puzzle Screens. Play alone or go for the ultimate challenge of two-player simultaneous competition. Run along the colorful girders, jump across the tremendous chasms, climb the ropes and ladders, or grab a BYRD and fly to get the loot before your opponent does, but watch out! The KATS are on the prowl and your opponent is tossing eggs! Run, jump, climb, or fly to your nearest Color Computer and play CASHMAN!

32K - Tape $27.95
Disk $29.95

# DEMON SEED

*By Jeffery Sorenson*
*& Phillip MacKenzie*

All alone in the silence of space, you switch on the view-port to look at the brilliant stars. And then you see THEM: a massive hoard of bat-like aliens, swarming towards you! The ship trembles under the distant explosions of enemy fire. You have only one chance for survival - Fight! As you attempt to defeat each new wave of enemy ships, they only get stronger and faster! If by some miracle you survive the first assault, you find yourself pitted against enemies so swift, powerful, and outright evil that only one name fits them - DEMONS! And if that's not enough, they bring out the heavy artillery - the Mother Ship! Engaging in battle, you see a dark cloud against the stars: another invasion fleet!



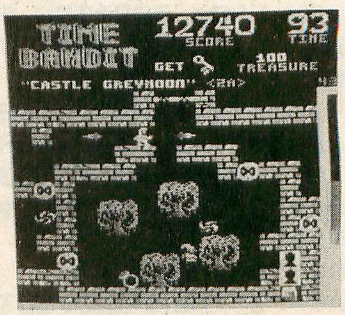
Created in the same spirit of the classic arcades games like Phoenix and Galaga, DEMON SEED is a great package of arcade fun and action. Different screens of bats, demons, and special challenge rounds keep the excitement high and the competition stiff!

32K-Tape $27.95
Disk $29.95

# TIME BANDIT

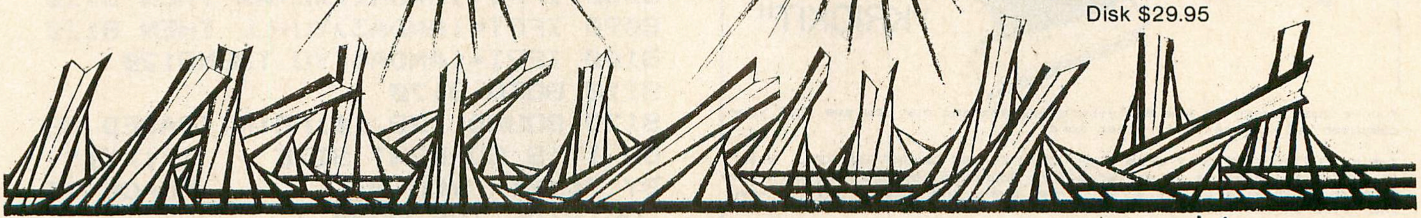
*By Bill Dunlevy & Harry Lafnear*

Tired of games that only have a few screens or force you to follow strict levels? In TIME BANDIT, you virtually create your own game! You can choose from more than TWENTY places through-out the game, with more than 15 distinct variations and levels of difficulty in each place; this means over 300 variations!



Use the TIMEGATES to travel to the three different Worlds of Time, each containing a multitude of colorful and unique adventuring areas. Visit the medieval dungeons of FANTASY WORLD, recapture the days of yesteryear in WESTERN WORLD, and reach for the stars in FUTURE WORLD. Fight the Evil Guardians: the Looking Lurker, Angry Elmo, Killer Smurphs, and more! Find the Keys and escape with the treasures of time. But hurry - your power is fleeting! Crisp Supergraphics, colorful scrolling landscapes, full animation of a multitude of characters, great sound, and over THREE HUNDRED SCREENS - it's all here! The conquest of time and space awaits!

32K - Tape $27.95
Disk $29.95



6655 Highland Road
Pontiac, Michigan 48054
**Orders & Info: (313) 666-4802**
Master Charge and VISA OK. Add $3.00 for shipping in the U.S.A. - $5.00 in Canada. Dealer inquires invited.

**MichTron**

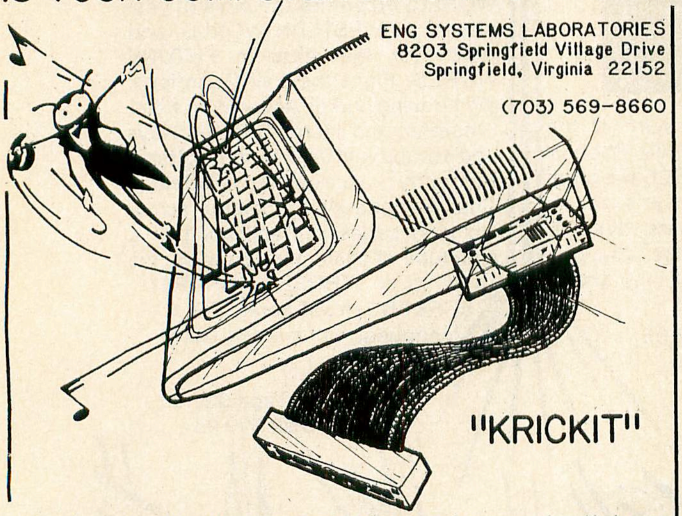
see us at RAINBOWfest
CHICAGO

```
3170 IFD$="Y"THENPI=0:GOTO470
3180 CLS:PRINT@64,"  DO YOU WANT
 A COPY ON YOUR    PRINTER? (Y/N
)"
3190 D$=INKEY$:IFD$=""THEN3190
3200 IF D$="N"THEN 3240
3210 PRINT:PRINT"  IS PRINTER YO
UR PRINTER READY FOR GRAPHICS? (
Y/N)
3220 D$=INKEY$:IFD$=""THEN3220
3230 IFD$="Y"THEN PRINT#-2,CHR$(
18):Y=USR(0)
3240 CLS:PRINT@32,"  IF YOU WANT
 TO SEE YOUR ROOM  AGAIN PRESS<E
NTER>.":PRINT"  IF YOU WANT TO C
HANGE THE LASTPIECE PRESS 'C'.":
PRINT"  IF YOU WANT TO REARRANGE
 THE  ROOM FROM SCRATCH PRESS 'S
'.":PRINT"  IF YOU WANT TO DRAW
NEW ROOM  PRESS 'N'."
3250 A$=INKEY$:IFA$=""THEN3250
3260 IFA$=CHR$(13)THENSCREEN1,1:
FOR O=1TO 3000:NEXT:GOTO3240
3270 IFA$="S"ORA$="N"ORA$="C"THE
N3280ELSE3250
3280 IFA$="C"THEN3040
3290 IFA$="S"THENPCLS:GOTO390
3300 PCLS:GOTO70
4000 IFPI=0THENLINE(K,L)-(K+XX,L
+YY),PRESET,B
4010 IFPI=1THENCIRCLE(K,L),R,0
4020 RETURN
5000 IFAC$="V"THENE=XX:XX=YY:YY=
E:W=1
5010 IFAB$="U"THENYY=-YY
5020 IFAA$="L"THENXX=-XX
5030 RETURN
6000 CLS:PRINT@99,"POSITION THE
STARTING POINT."
6010 PRINT:PRINT"USING THE PROPE
R ARROW KEY MOVE THE DOT TO THE
DESIRED STARTING POINT.":PRINT"
  CIRCLES START AT CENTER.":PRIN
T"   RECTANGLES STARTING POINTS
  DEPEND ON THE WAY YOU ELECTED
TODRAW THEM. IE; LEFT-UP,RIGHT-
  DOWN ETC."
6020 PRINT:PRINT"NOTE:EACH TIME
YOU PRESS ARROW  KEY IT MOVE THE
 DOT TWO INCHES."
6030 PRINT:PRINT"          PRESS
ANY KEY"
6040 AD$=INKEY$:IFAD$=""THEN6040
6050 RETURN
7000 IFAA$="L"THENXX=-XX
7010 IFAB$="U"THENYY=-YY
7020 IFAC$="V"THENE=XX:XX=YY:YY=
E
7030 RETURN
8000 A1=K+XX:A2=K-XX:A3=L+YY:A4=
L-YY
8010 IFAC$="V"THENA1=K+YY:A2=K-Y
Y:A3=L+XX:A4=L-XX
8020 IFPI=1THENA1=K+(XX/2):A2=K-
(XX/2):A3=L+(YY/2):A4=L-(YY/2)
8030 IFAA$="L"ANDA2<XL THEN8120
8040 IFAA$="R"ANDA1>XL+WW THEN 8
120
8050 IFAB$="D"ANDA3>YU+LL THEN 8
120
8060 IFAB$="U"ANDA4<YU THEN8120
8070 IFPI=1ANDA2<XL THEN8120
8080 IFPI=1ANDA1>XL+WW THEN 8120
8090 IFPI=1ANDA3>YU+LL THEN 8120
8100 IFPI=1ANDA4<YU THEN8120
8110 GOTO 8170
8120 SOUND 128,10:PRINT"BASED UP
ON IT'S CURRENT SIZE    (";XX;"
BY ";YY;" YOU WILL      PLACE IT
 OUTSIDE THE ROOM."
8130 PRINT"IF YOU WANT TO CHANGE
 IT'S SIZE PRESS 'C'. TO REPOSIT
ION IT      PRESS 'R'."
8140 C$=INKEY$:IFC$=""THEN8140
8150 IF C$="R"ORC$="C"THEN 8160E
LSE8130
8160 IFC$="R"THEN2000ELSE470
8170 RETURN
```

IS YOUR COMPUTER IGNORING YOU ???

ENG SYSTEMS LABORATORIES
8203 Springfield Village Drive
Springfield, Virginia 22152

(703) 569-8660



"KRICKIT"

You've just typed in the Gettysburg Address and now you see that your computer only heard every other word!

THE KRICKIT CHIRPS ONLY WHEN YOUR COMPUTER HAS CAUGHT THE KEY. With the Krickit, there is no wasted effort pounding keys to make sure they contact or looking at the screen after every character. You can keep your eyes on the listing and not lose your place.

Works great with text editors and DBM's (Telewriter-64 and Homebase, to name a few) or when entering programs with just the BASIC line-editor in your computer. Just plugs in! Needs no software or hardware modifications. Built-in speaker! Uses no CPU time! Your computer has better things to do than sound key beeps.

The Krickit has other valuable features, too. A convenient switch controls the Cartridge Interrupt line. Instead of clumsy, messy tape on fingers 7 or 8, just flip the switch to access Basic with a game pak installed. It also has a more accessible reset switch, lighted power indicators, gold edge-fingers and an extension cable.

We are sure that after you try the Krickit you will never want to be without it. Take 30 days to decide you like it or return it for a full refund. 24-hour order line. Order yours today for only $59.95 (plus shipping and handling). COD, Visa, and Mastercard accepted.

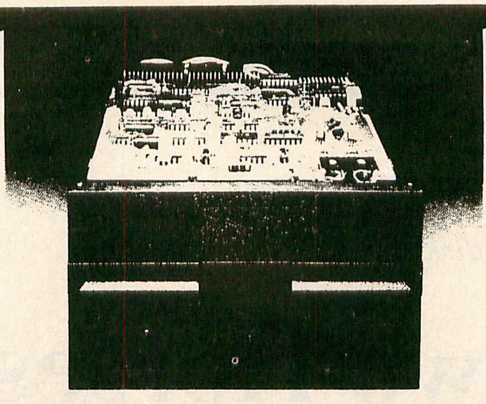
# DISK DRIVES

STARTING AT

**$159.00**

**WITH CASE & POWER SUPPLY**

$189.95



TANDON MPI TEAC

Speed 5ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty 6 months

**ORDER TOll FREE!**
**1-800-635-0300**

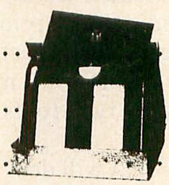
**CALL FOR SALE PRICES**

Even more savings!!

ALL DRIVES FULLY TESTED&WARRANTEED

| | |
|---|---|
| Complete Disk Drive with Power Supply & Case | $189.95 |
| Two Drives in Dual Case & Power Supply | $359.00 |
| 1/2 ht double sided double density Disk Drives (Panasonic) | $219.95 |
| 1/2 ht double sided double density Disk Drive with ps & case | $249.95 |
| 2 double sided double density drives with ps & case | $489.95 |
| Single ps & case | $39.95 |
| Color Computer Controller<br>Supports double sided double density drives with 1 year warranty and manual. | $139.95 |

Ask about our 3way Color Computer Drive Kits



| | |
|---|---|
| Complete with Diskettes | starting at $329.95 |
| Diskettes with FREE library case | $19.95 |
| Head Cleaner Kits | $Call |
| Unadvertised Specials | $Call |
| **Drives cleaned, aligned & tested** | $29.95 |

TECHNICAL STAFF ON DUTY, PLEASE CALL FOR ASSISTANCE.

**CALL US TODAY!!** (617)234-7047

*DEALER INQUIRIES INVITED.

*TRUE DATA PRODUCTS*

**195 Linwood Street, P.O. Box 546**
**Linwood, Massachusetts 01525**
**(617) 234-7047**
HOURS MON-SAT 9-6 (EST)

We welcome
- Visa/Master Charge
- Checks (allow 2 weeks for clearing)
- C.O.D. Add $2.00

*Controlling the printer and disk*

# Riding Two Horses

**By Richard White**
**RAINBOW Contributing Editor**

Thomas Earl writes that he wants to learn how to control his printer to skip perforations when printing lengthy data or other printing. He also asks "How can I write a program line in a BASIC program to vary the number of lines per page and the number of lines to the top of form?" And the process or routines should be valid for most other printers.

Taking the last first, variations from one printer to another are a cause for despair to any programmer preparing software for public consumption. Something as simple as doing *PRINT#-2,""* does not work to cause a linefeed with some printers like it does with any Radio Shack printer. *PRINT#-2," "*, that is a space between the quotes, is needed. Still it is possible to write BASIC that will work with most printers provided fancy things like changing type fonts are not attempted.

Now there is no one line of BASIC code that will deal like magic with skipping perforations when making multi-page listings. Rather, the programmer needs to define the page and then provide code that counts the number of lines as they are sent to the printer. And just counting the lines is not enough. You need to test that count against the number of lines allowed per page and advance to the new page when allowed line count is equaled or exceeded. If you were printing address labels, the logic of the situation would be different since you are dealing with, say, a six-line label rather than a 66-line page.

A convention registration program coordinator needed to print an acknowledgement letter, then print the next sheet with return address and addressee to serve as a mailing wrapper and finally index to the next sheet for the next letter. Letter length varied since the letter would cover one or more registrants and there were activity choices which changed with each registrant. The only way for BASIC to know how many lines were printed was to increment a counter each time a line was printed. Let's walk through some codes and see this working.

```
400 POKE150,41:CLS:PRINT@96,"TYPE IN TODAY'S DATE"
    :LINEINPUTDA$: PRINT: PRINT: PRINT"SET TOP OF
    PAPER TO TOP OF": PRINT "PRINT HEAD AND PRESS
    ENTER": INPUTI$: PRINT"ENTER STARTING
    REGISTRATION #": INPUTRN
```

There are generally some initial things to be done. In line 400, the Baud rate is set, the date is obtained, the user is reminded to line up the paper and the starting point in the file specified.

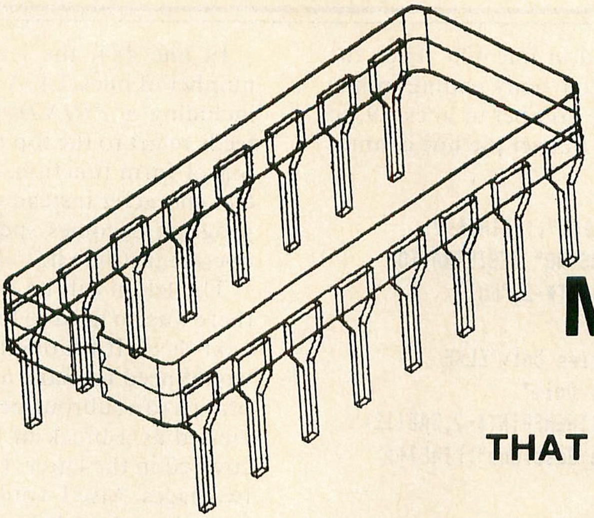
```
406 PRINT#-2," ":PRINT#-2," ":PRINT#-2,TAB(34)
    "RAILFEST '84":PRINT#-2,TAB(34)"MAY 4-6, 1984"
    :PRINT#-2,TAB(25)"THE RESORT INN BY KINGS
    ISLAND"
```

```
424 PRINT#-2,TAB(6)"confirmation and bring it with
you to facilitate registration at the"
:PRINT#-2,TAB(6)"Motel.":LI=29
```

*(Richard White has a long background with microcomputers and specializes in BASIC programming. With Don Dollberg, he is the author of the TIMS data base management program.)*

— ADVERTISEMENT —

# THE PHANTOM MEMORY



## THAT LOST 32K

It is surprising how soon the error message "0M" appears when I write a program which handles a significant amount of data. The use of PCLEAR1 only temporarily clears the problem and I have to break up the program or store the data in direct access files on the disk. I like to keep the data in RAM to speed up processing and minimize disk accesses. I find this frustrating as I know that with the 64K RAM there is a PHANTOM 32K which I cannot get at.

Programs such as FLEX and OS-9 use all of this RAM, but consume much of it for the operating system. For a while I used a simple machine language program to access this memory, but it tended to be too inconvenient. The solution was to design a program which integrates with COCO's BASIC. The result was the PHANTOM MEMORY program.

The PHANTOM MEMORY package adds a new type of array which is indicated by preceding the variable name with P and an exclamation (P!) symbol. There are 32767 memory bytes available for these arrays, enough for 32767 characters, 6460 numbers, or any combination thereof.

All of these PHANTOM array variables can be used in the same way as the regular array variables in a BASIC program, (program 1).

Notice the new command PDIM, and the new variable P!A(15). PDIM declares the array in the same way as the normal DIM statement. In program 1 it is used to define two arrays P!A(300), a 300 element numerical array, and P!B$, a 40 element string array with strings of maximum length 16 characters. These PHANTOM variables are then used in the following statements exactly as though they were normal arrays.

The statement PDIM 0 in line 5 is used to reset the PHANTOM array. If this is not used at the beginning of a program all of the PHANTOM variables defined in the previous program become available to the next program. This adds the ability to chain programs, each program loading the next as in programs 2 & 3. Thus it is possible to have one program generate data which is then processed by a second etc.

The PHANTOM MEMORY program is written in machine language and costs little in speed. It can be added to your system simply by using the LOADM or CLOADM command at the start of each session or by using the command at the start of the program.

The PHANTOM MEMORY program is available on disk and tape for $29.95 and a cartridge version will be announced soon. It requires EXTENDED BASIC and, of course, 64K of RAM.

Order from: TRILLIUM SYSTEMS
67 King St. East
OSHAWA, ONTARIO
CANADA L1H 1B4

RAINBOW CERTIFICATION SEAL

```
1 'PROGRAM #1
5 PDIM 0
10 PDIM A(30),B$(40,16)
20 P!A(15)=355/113
30 P!B$(10)="STRING"+STRING$(5,"
#")
40 X=14*P!A(15)+9.3
50 PRINT "A= ";X
60 PRINT "B$= ";P!B$(10)
```

```
10 'PROGRAM # 2
20 'PROGRAM TO GENERATE DATA
25 CLEAR 500
30 PDIM 0
40 PDIM DAT1(2500),SDAT$(120,150
)
50 FOR I=2000 TO 2400
60 P!DAT1(I)=SQR(I)
65 PRINT @455,I
70 NEXT I
80 FOR I=&H41 TO &H70
90 P!SDAT$(I)=STRING$(150,I)
100 NEXTI
110 RUN "PROG3"
```

```
10 'PROGRAM #3
20 'PROGRAM TO RETRIEVE DATA
25 PRINT"NOW IN PROGRAM # 3"
30 PRINT"ROOT 2200";P!DAT1(2200)
40 PRINT"STRING # &H66";P!SDAT$(
&H66)
```

Printing of the heading is started in line 406. Then the addressee is printed and a fixed letter body ending in line 424. This text always takes the same number of lines, 29, so we don't need to count line by line, but set the line counter LI=29.

```
427 PRINT#-2," ":PRINT#-2,TAB(5)" ";:PRINT#-2,
    USINGUS$(0);NA$;:PRINT#-2,USING" REGISTRATION
    NO. ###  ";RN;:IFAB=1THENPRINT#-2,"Full
    Registration"
430 IFAD=1THENPRINT#-2,"Activities Only"ELSE
    IFBO=1THENPRINT#-2,"Banquet Only"
433 PRINT#-2," ":LI=LI+3:IFTE=1THENPRINT#-2,TAB(12)
    "Thursday Evening Operating Sessions":LI=LI+1
    :PRINT#-2,TAB(6)" ";
```

Now we come to the variable data in the letter. Names, registration numbers and type of registration are printed in lines 427 and 430. This code is used for each registrant included in the letter. Since a blank line is printed before and after, three lines are used and LI is updated in line 433, LI=LI+3. The "Thursday Evening Operating Sessions" in line 433 is an optional event and may or not be printed. The LI=LI+1 operates only when the preceding is printed. A selection of choices follows and the same pattern occurs. An *IF . . . THEN* includes a print statement and LI=LI+1.

```
484 ...:FORI=LI TO 66:PRINT#-2,"
     ":NEXT:PRINT#-2,TAB(3)"RAILFEST '84"
```

In line 484, the letter is finally finished. It has some number of lines, LI. A simple *FOR. . . TO. . . NEXT* loop including a *PRINT#-2,"  "* sends the printer enough line feeds to get to the top of the next page. If your printer has a top-of-form function, then you could send the proper control character instead of using the loop. Now, however, the program becomes specific to your printer and those that operate just like it.

The letter will be one page in all instances (I hope), so there was no need to look for, say, a line 62 and index to the next sheet. If I thought that two pages might be required, I would need to make a test at the beginning of line 427 and branch to a subroutine to start a new page. The letter may be viewed as a block of lines associated with each registrant covered in the letter. I would not want to split a block over two pages. Also I would like to minimize the number of tests for page ending. If I say that in the worst case there might be six lines for each registrant, then I would want to start a new page if LI=>56. Actually, the *IF LI*=>56 GOSUB . . . has to be in line 426 and any *GOTO 427s* must be changed to *GOTO 426s.*

If the foregoing seems like a bunch of bother, it is. It might seem easier to write a machine language utility to intercept and count each *PRINT#-2* and start a new page when a specified number of lines have been printed. But, what about the problem of blocks of data that need to be kept as a group of lines. No generalized program can know when you want to do this. Yet that is not an infrequent occurrence. It seems best to put up with the bother of counting in BASIC since that is the only way you can exactly control your program. BASIC is a language to tell the computer exactly what you want to do. If what you want to do is complicated and full of choices, then your code cannot be simple.

We see the same principle play out in various commercial database programs for CoCo and other microcomputers. A carefully constructed BASIC program may be easy to use, but be limited in capabilities. A very powerful, machine language program may allow you to have many fields, do math on field values and store many records on disk. But, the manual is long and complicated, the program is hard to learn and to remember and the sort and search operations may take all night. There are always trade-offs and some things just need lots of thinking and time to get done right.

Another interesting aspect of the convention registration program is the data storage. Disk BASIC provides for both sequential files and direct access files. Direct files are seldom discussed since most small programs get along well with sequential files. The registration program uses both types of files and provides clear illustrations of the use of each.

The purpose of the registration program is to store all the information that relates to each registrant as well as cumulative information like how many are registered for each activity and how much revenue each activity has produced. Since there will be a few complimentary registrations issued, a straight multiplication of number registered times the registration fee will not do. Further, the registration fee goes up a few dollars for the late registrants and these transactions and totals need to be tracked.

A sequential file called *CONVSUMM* was created to store the totals which include dollars and numbers registered for each event. When the program is run, it goes directly to the initialization code starting at line 2000 (remember that I like code that is seldom used at the end of

**PERSONAL BOOKKEEPING 84**
WHAT OTHER PERSONAL BOOKKEEPING SYSTEM
HAS ALL THESE FEATURES?

- Quick-and-easy data entry — use day-to-day.
- Logical abbreviations for data entry — no special symbols.
- On-line help for data entry.
- "Intelligent" data entry minimizes keystrokes and rejects illogical keystrokes and entries. (Example: For date, just press "4"; computer realizes there is no month with 40 days.)
- Change data at any time as easily as new entries.
- 25 accounts; 26 expense categories.
- Cash and credit card expenses entered as easily as checks.
- Seperate record of extraordinary expenses.
- Monthly and yearly printed reports.
- COLOR graph compares expenses.
- Monthly table of expenses compares last 4 or 8 months and shows % changes.
- Yearly report itemizes expenses, totals taxed and non-taxed and extraordinary expenses, totals income, prepares reports of interest on accounts and sales taxes on expenses.
- Dupe latest entries in seconds (requires 2 drives).
- Complete printed report of all accounts.
- Balance checkbook in minutes.
- SEARCH file by transaction, expense, check number, payee or note.

Requires 32K extended BASIC
with disk drive and printer.
**$27.95 plus $1.50 shipping**
**AMDT-STARDANCERS, INC.**
**766 Brady Avenue**
**Bronx, New York 10462**
**212/597-7709**

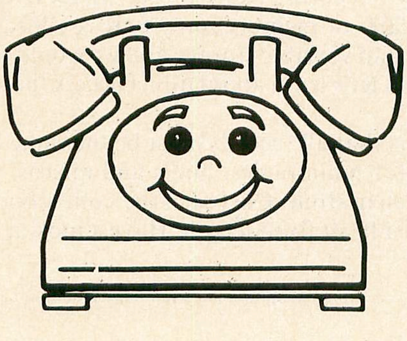
the program). The code in line 2020 *OPENs* the sequential file named *CONVSUMM* as an input file through disk buffer 2. As long as we have buffer space provided with the *FILES* statement in Disk BASIC, we can have up to 15 disk files open at once, each having a different buffer number. The values on disk are then read in following the *INPUT#2* statement. A list of variables, separated by commas but they could have been separated by semicolons, follows *INPUT#2,*. Next, a *FOR . . . TO . . . NEXT* loop containing *INPUT#2,SM(X)* is used to read in an array of variables. It probably would have been as easy to list the *SM(X)* variables as *SM(0), . . . SM(7)*, but using *FOR . . . TO . . . NEXT* added a bit of variety to an otherwise dull typing job.

```
2000 'INITIALIZATION AND VARIABLES
2020 OPEN"I",#2,"CONVSUMM":INPUT#2,SF,DF,SA,DA,SB,
     DB,HA,DH,OA,DO,CM,BR,DC,DS,TR,RC,DR,RG,SL,
     NC(1),NC(2): FORX=0TO7: INPUT#2,SM(X): NEXT
     :CLOSE#2
```

Note that I closed the file when all data was in. This not only is good housekeeping, but is necessary so I can open the same files as an output file to save updated data when new registrations are entered. Once the file is closed, the program falls to some variable initialization starting at line 2070. I have formatted the entries in line 2080 to highlight them. *US$(X)* variables define various formatting strings to be used with *PRINT USING*. We have discussed *PRINT USING* before and reviewed how it can be used to control printing data to screen or printer. Keeping all these strings in one place is good practice if only because you know where to go to see what they are when you forget, as you most assuredly will.

```
2070 CF=35:CA=20:CB=15:CT=5:CC=5
2075 SM$(0)="NO": SM$(1)="10:00": SM$(2)="10:30"
     :SM$(3)="11:00": SM$(4)="11:30"
     :SM$(5)="12:30": SM$(6)=" 1:00":SM$(7)=" 1:30"
     2080 US$(1)="%              %"
     :US$(3)="%   %"
     :US$(4)="%        %"
     :US$="#####"
     :US$(0)="%                      %"
     :US$(2)="% %"
     :US$(5)="$$######"
     :S8$="        "
2090 RETURN
```

As noted before, the *CONVSUMM* file must be reopened and the updated data saved when new registrants are entered. The code to do this follows. The thing to note is that the variables are not listed after one *PRINT#2,* statement. There is method to this madness. This assures that each piece of data is stored with a delimiter on disk and that *INPUT#2,* will properly separate data. A save routine using *WRITE#2,SF,DF,SA . . .* could have been used with assurance that data would have been clearly separated on the disk. I prefer to use *PRINT#2,* since it will work to tape with only a device number change.



**AUTOTERM**
TURNS YOUR COLOR COMPUTER INTO THE
**WORLD'S SMARTEST TERMINAL!**
YOU'LL ALSO USE AUTOTERM FOR SIMPLE
WORD PROCESSING & RECORD KEEPING

**EASY TO USE**

ON-SCREEN EDITING via cursor. Full prompting and error checking. Key Beep and Error Beebop. Scroll bkwd/fwd while on line. Save/load files while on line. Maintain a disk copy of session. Automatic graphics. True lower case. Screen widths of 32, 40, 42, 50, 64. No split words on screen/printer. Print all or part of text. Search for strings. Well written manual goes step-by-step and has many KSM examples. Back cover is a cheat sheet.

**RECOMMEND 32K to 64K**
**EASY UPGRADE**
**Price Difference +$13**

**PLEASANTLY POWERFUL**

Total communications ability, 128 ASCII chars, 1200 baud, etc. Send text, graphics, BASIC, ML. Scan/Edit current data while receiving more data. Any modem. Fully supports D.C. Hayes and others. Any printer, page size, margins, etc. Override narrow text width of received data. Examine/change parameters, KSMs and disk directories at any time. Handles files which are larger than memory.

**CASSETTE $39.95**
**DISKETTE $49.95**
Add $3 shipping and handling
**MC/VISA/C.O.D.**

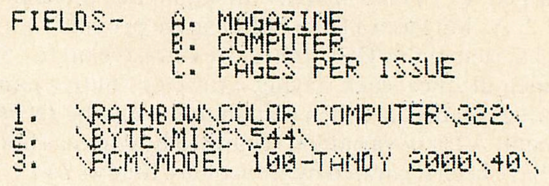
**TRULY AUTOMATIC**

Create, edit, print, save and load Keystroke Multipliers (KSMs). KSMs automate almost any activity. Dial via modem, sign-on, interact, sign-off. Perform entire session. Act as a message taker. KSM may include parameter changes, disk operations, editing, time delays, looping, execution of other KSMs, waiting for part-specified responses, branching based upon responses.

**PXE Computing**
**11 Vicksburg Lane**
**Richardson, Texas 75080**
**214/699-7273**

```
1200 'END ROUTINE
1205 CLOSE#1
1210 OPEN"O",#2,"CONVSUMM"
     :PRINT#2,SF: PRINT#2,DF: PRINT#2,SA
     :PRINT#2,DA: PRINT#2,SB: PRINT#2,DB
     :PRINT#2,HA: PRINT#2,DH: PRINT#2,OA
     :PRINT#2,DO: PRINT#2,CM: PRINT#2,BR
     :PRINT#2,DC: PRINT#2,DS: PRINT#2,TR
     :PRINT#2,RC: PRINT#2,DR: PRINT#2,RG
     :PRINT#2,SL: PRINT#2,NC(1): PRINT#2,NC(2)
     :FORX=0TO7: PRINT#2,SM(X): NEXT: CLOSE
```

When memory economy is a major consideration, such as it might be in a data file that is being kept entirely in memory, one looks for a record structure that wastes the least space. But first, a couple of definitions. A field is an item of data for the computer to remember. If we were making a list of computer magazines, RAINBOW would be an entry into a field. We might name the field MAGAZINE NAME. There would be other items of data that would be associated with the data item RAINBOW. Together this group of data items make a record. If our target were minimum memory use, we would want to keep each field entry to just the number of bytes to do the job. Figure 1 shows how this was done in the *TIMS* database manager.



```
FIELDS-   A. MAGAZINE
          B. COMPUTER
          C. PAGES PER ISSUE

1.  \RAINBOW\COLOR COMPUTER\322\
2.  \BYTE\MISC\544\
3.  \PCM\MODEL 100-TANDY 2000\40\
```

**Figure 1. Variable field records.**

The backslash is a field divider that allows the program to determine the beginning and end of each field. Fields and records are only as long as they have to be. Field lengths do not have to be predetermined, a feature that users like. Fields can carry numeric data as strings which would later be converted using *VAL()*. As long as the entire database is in memory, any field from any record is instantly accessible. Ah, were life and computing always so easy.

When the amount of data exceeds memory and we still wish to maintain random access, that is recover a specific record directly, we must use direct access disk files and life gets more structured. Such is the case with our individual registration records. The first cut called for capability to store 650, 130-byte records. That's 84,500 bytes. Even in an IBM PC with 320K of memory, only 61K is allocated for BASIC programs and variable storage and we would face the same problem. So let's learn about direct access file storage on disk.

The first rule is that all records must be the same length. This is the rule for mainframes, minis and micros, so let's accept it as written in stone. Carved in the same stone is rule two — fields must be of fixed length. Have a look at Figure 2.

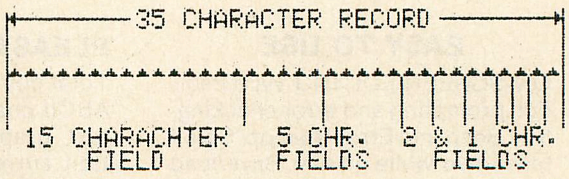


**Figure 2. A 35-character record divided into a number of shorter fields.**

HARDWARE PRODUCTS FOR THE TRS-80 COLOR COMPUTER®

SOLDERLESS MEMORY UPGRADES
Installs in 15 minutes without removing SAM chip. Includes fully-illustrated instructions, IC extractor, RAM button, and 90-day unconditional warranty. Please specify board series. These upgrades are not compatible with the Color Computer 2.
4K—16K.....$20.00 • 16K—32K.....$40.00 • 4K—32K.....$50.00

SERIAL SWITCHER
Bi-directional switcher allows you to expand your serial port to two or three peripherals or to connect one peripheral to two or three computers. 2 Ports.........$25.00 • 3 Ports.........$30.00
Available with mounted Pilot Light—Add $5.00

I.C.s
Basic ROM 1.2 ..... $35.00
E.C.B. ROM 1.1 .... 60.00
D.E.C.B. ROM 1.1 ... $35.00
6809E—CPU ....... $25.00
6883—SAM ........ $25.00
6847—VDG ........ $20.00
6821—PIA ......... $8.00
All four, only ....... $65.00
6822—H.D. PIA ..... $15.00
4164—64K RAM ..... $6.50
Set of eight ........ $50.00
4116—16K RAM ..... $1.10
Set of eight ......... $8.00

64K FOR $75.00
Price includes expert installation, a 64K RAM Button, 64K Software (specify disk or cass.), a 64K User Sheet, Return Shipping, and a 90-DAY UNCONDITIONAL WARRANTY. Requires 1.1 or newer Basic ROM. Send your operating 285 (F) Series Color Computer, TDP-100, or Color Computer II with a Cashier's Check or Money Order for fastest return. For D, or E Series boards, add $20.00. If necessary, add $35.00 for new ROM.

TERMS: Cashier's checks and money orders for immediate delivery • Personal checks allow 2 weeks • Orders $100 to $199 save 10% • $200 and over save 15% • California residents add 6% • Orders under $25 add $2 shipping • C.O.D. add $4

4418 E. Chapman Ave., Suite 284
Orange, CA 92669
(714) 639-4070
VIDTRON T.M.
★FREE★ CATALOG

Here we have a 35-character record with each byte represented by an arrowhead. The record is divided into one 15-byte field, two five-byte fields, and a number of two- and one-byte fields. Fields may be defined as character or numeric. The first field will always be 15 bytes even if JOE were the only piece of data in it. If you tried to cram RAINBOW into the second field the OW would be lost and you would get back RAINB.

Why all these rules? Well, you can both read and write to a direct access file. If you are using a 35-character record and want to rewrite record 55, there are only 35 bytes of space before you start writing over the start of record 56. The computer is keeping track of where the data is by calculated location in the file or record. You tell the computer the space allocation rules and it expects you to live by your own rules — it certainly will.

The first step in establishing the rules is to open the file.

```
910 OPEN"D",#1,"EXAMPLE",35
```

This opens a direct (D) file using buffer 1 as the file named *EXAMPLE* with 35-byte-long records.

Next the fields must be defined. For the record shown in Figure 2 the following code will serve.

```
915 FIELD#1,15 AS F1$,5 AS F2$,5 AS F3$,
    2 AS F4$,2 AS F5$,2 AS F6$,1 AS F7$,
    1 AS F8$,1 AS F9$
```

*FIELD#1* identifies buffer 1. Thereafter, each field is given a length and assigned to a variable. The statement *15 AS F1$* says that the first 15 bytes make a field that is assigned to string variable *F1$*. All the variables are string variables. You need to keep count to make sure that the total number of characters assigned to fields equals the record length defined in the *OPEN* statement. If you aren't quite sure how many fields and characters you will eventually need, *OPEN* the file with more characters than you immediately need and add one field to hold the excess. Then as you add fields, you add them just before the last field and reduce the size of the last field accordingly in your *FIELD* statement. Remember, the computer works down the record identifying fields in the order you show them in the *FIELD* statement. If you insert a field and deduct the bytes assigned from the following field, the computer won't know the difference.

As an example, let's redefine our *EXAMPLE* file to have 50 characters.

```
910 OPEN"D",#1,"EXAMPLE",50
```

Next, we will do a *FIELD* statement that adds one more field of 15 characters.

```
915 FIELD#1,15 AS F1$,5 AS F2$,5 AS F3$,
    2 AS F4$,2 AS F5$,2 AS F6$,1 AS F7$,
    1 AS F8$,1 AS F9$,15 AS F0$
```

Sometime later we find we need another 5-character field. We need only change the field statement and the statements that save and load the record. Note that our new field will be *G0$* and that *F0$* was reduced to 10 characters.

```
915 FIELD#1.15 AS F1$,5 AS F2$,5 AS F3$,
    2 AS F4$,2 AS F5$,2 AS F6$,1 AS F7$,
    1 AS F8$,1 AS F9$,5 AS G0$,10 AS F0$
```

Data is loaded into a field left justified using *LSET* or right justified using *RSET*. For our first field *LSET F1$ = DA$* puts whatever is in *DA$* left justified into *F1$*. If *DA$* is longer than 15 characters, the right portion of the string is truncated (lopped off and lost to you ordinary people). *RSET F1$ = DA$* right justifies the contents of *DA$* into *F1$*. Again the right portion is truncated if *DA$* is longer than 15 characters. To store a number, the computer must be told to make the number into a string five characters long. Then *LSET* the result into the field variable. *LSET F2$ = MKN$(NM)* does the job.

Saving a record is a two-step process. Data must be assigned to all field variables and the the record must be *PUT* to disk.

```
920 IF FG=1 THEN 950
930 LSET F1$=DA$:LSET F2$=MKN$(NM)
    :LSET F3$=MKN$(A):LSET F4$=A2$
    :LSET F5$=CI$:LSET F6$=ZP$
    :LSET F7$=N$:LSET F8$=MID$(STR$(AB),1)
    :LSET F9$=MID$(STR$(AO),1)
    :LSET G0$=MKN$(BO):LSET F0$=""
940 PUT#1.RN:CLOSE#1:RETURN
```

Since a single *OPEN* statement opens the file for either saving or record retrieval, a flag is tested in line 920 to determine whether to retrieve a file, *FG=1*, or save a file. Data is assigned to the field variables in line 930. *PUT#1,RN* loads the record into buffer 1. It will be stored as record number *RN*. If the buffer is not full, the record is not

**SOFTWARE PRODUCTS FOR THE TRS-80 COLOR COMPUTER®**

**EDITTRON** T.M.

**Full-Screen BASIC Program Editor**

**SAVES YOU TIME!**

Let EDITTRON cut your programming time in half! You will appreciate the absolute ease at which this Full-Screen Editor allows you to **INPUT, EDIT**, and **DEBUG** your BASIC programs. EDITTRON performs these functions:

**CURSOR-CONTROL**
- Directional Movement
- Screen Scrolling
- Home the Cursor
- Limit the Cursor
- Down Page
- Up Page
- Search a Line
- Call a Line
- Find a String
- Repeat Find

**SCREEN-EDITING**
- Change Characters
- Extend a Line
- Kill a Line
- Insert Characters
- Delete Characters
- Move a Line
- Split a Line
- Copy a Line
- Merge Two Lines
- Auto-Numbering

**Other features include:** Auto-Repeating keys, Key Tone, user-friendly Prompts and Error Messages, and 24 pages of comprehensive, easy-to-read Documentation.

EDITTRON is a 3K, fully position-independent Machine Language program that requires a minimum 16K of RAM, and Extended Color BASIC.

**CASSETTE..................$ 35 DISKETTE .............$ 40**

**4418 E. Chapman Ave., Suite 284**
**Orange, CA 92669**
**(714) 639-4070**

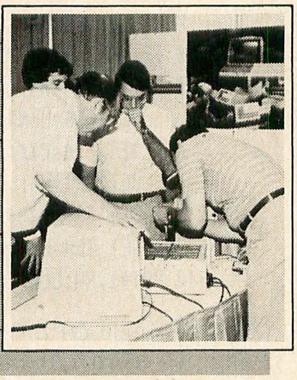
**VIDTRON** T.M.

★FREE★ CATALOG

Plan to Attend the 3rd ANNUAL OS-9 USERS SEMINAR

August 17, 18, 19, 20
Pre-Registration Only!

- MORE INFORMATION
- MORE EXHIBITS
- MORE SPEAKERS
- HARDWARE
- SOFTWARE

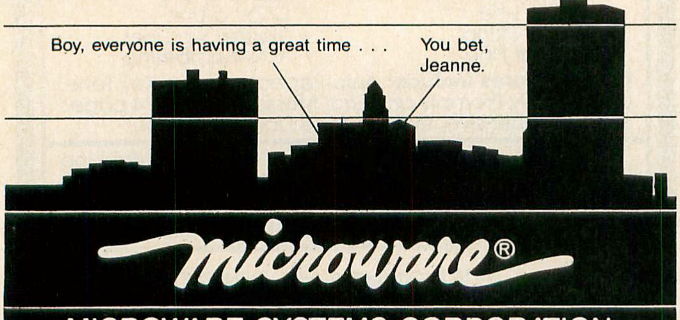


- TECHNICAL SESSIONS FOR 6809 & 68K

Plan now to attend the 3rd Annual OS-9 User Seminar. This is an event you won't want to miss if you use, sell or are interested in systems that use Microware 6809/68000 software. Informative round-table discussions on almost every aspect of the design and use of Microware software will be held. A bigger and better exhibit area will have display booths from many of the leading suppliers of OS-9 compatible hardware and software. Don't miss this chance to increase your knowledge and skill in the latest microcomputer software technology — Register today!!!

Fee: $125
Location: Marriott Hotel
Des Moines, Iowa

Don't Miss It: Pre-Register Now!
Call: 515/279-8844 or Write:


Boy, everyone is having a great time . . .
You bet, Jeanne.

microware®
MICROWARE SYSTEMS CORPORATION
P.O. Box 4865 • Des Moines IA 50304

OS-9 and BASIC09 are trademarks of Microware and Motorola.

immediately saved to disk. Normally, the computer will wait for a full buffer before making a disk access. If there may not be more data, it is safer to *CLOSE* the file rather than risk an error or ending the program without all data saved to disk. So, the file is immediately *CLOSEd* and we return to the calling routine. Actually, three different parts of the registration program use the same disk subroutine and it is cleaner for each to call the subroutine expecting all files to be closed and to leave the same way. Tidy programs work better and are easier to write and troubleshoot.

Records are recovered from the file with *GET#1,RN* where *RN* is the record number. In line 950, a test is made to assure that the record number does indeed exist in the file. If not, a message "record not found" is sent to the user and the program returns to the calling routine with the flag *FG=2* set to alert that routine that no record was found. In 960, the requested record is loaded from disk into buffer 1 and the data moved from the field variables into the working variables.

```
950 IFLOF(1)>RN THEN 960 ELSE PRINT@354,"record
    not found":FG=2:SOUND100,50:CLOSE#1:RETURN
960 GET#1,RN: DA$=F1$: NM=CVN(F2$): A=CVN(F3$):
    A2$=F4$: CI$F5$: ZP$=F6$: N$=F7$:
    AB=VAL(F8$): AO=VAL(F9$): BO=CVN(G0$):
    I$=F0$: CLOSE#1: RETURN
```

There are a couple of things to note in line 960. We used *MKN$* to convert the numbers *NM*, *A* and *BO* to strings to save them onto the record. Now we use *CVN()* to convert the string from disk to a floating point number. We had also converted the values in *AB* and *AO* which we knew would be integer digits to a single character and saved them that way to disk. Now we recover the numbers with the *VAL* function. In a file heavy with one- to three-digit integer data, considerable disk space can be saved this way. After all, you will need to convert numeric data into some sort of string, so it may as well be the shortest string possible. Finally the contents of field variable *F0$* must be moved out of the buffer so CoCo won't think it is part of the next record even though it's just holding space in case we should need more fields later.

And finally a bug, perhaps. When I first started using random files, I found that I could *OPEN* a file for the first time, save records to it as I wished and *CLOSE* it. The next time I opened it, I could resave existing records, but could not add new records to it. I was in my normal rush and decided to sidestep the problem by making a new file with the maximum number of empty records that I thought I would need. I could then save to this as I pleased as long as I did not exceed the maximum number of records in the file.

```
1910 OPEN"D",#1,"EXAMPLE",50: FIELD#1,50 AS F1$
1920 FOR X=1 to 600: F1$="": PUT#1,X: NEXT:
     CLOSE#1: END
```

The above code simply *OPENs* the direct file *EXAMPLE*, defines *F1$* as a 50-character field, and puts 600 empty 50-character records to the disk. An added advantage of this is that it reserves disk space immediately, and you need not worry about other files encrouching on space you may need later. And don't forget to *CLOSE* the file once it's made. This may be a Band-Aid, and any real solutions would be appreciated, though I may still reserve the space I think may be needed anyway.

# VIP™ Library

# Personal Productivity Tools for Modern Times

RAINBOW
CERTIFICATION
SEAL

## The Library Concept

State of the Art, Quality, Integrity, Compatibility and Affordability. Five things good software must possess. Five things that epitomize the **VIP Library™**. Each program is the diamond of its class, true excellence. These programs are first in features, first in power, first in memory, and all are affordably priced. And for your convenience all disk programs can be backed up.

## State Of The Art

All **Library** programs are written in machine code specifically for the Color Computer, to work without the interference of a separate operating system such as FLEX. From this comes speed and more work-space for you. Unlike other programs for the Color Computer which are said to be 64K compatible, **VIP Library™** programs are not limited to between 24 and 30K of workspace in 64K. **Library** programs have Memory Sense with BANK SWITCHING to fully use all 64K, thus giving up to 51K with a disk version and up to 53K with a tape version.

## Easy To Use

Each **Library** program was carefully designed to be extremely easy to use. Built-in on-screen help tables are at your fingertips, as are menus of all kinds. Every effort is made to use logical, intuitive and easy-to-remember commands. The manuals have been thoughtfully prepared to cover every aspect of the program, and they have complete tutorials to get you going right away. We set the standard!

## Lowercase Displays

State-of-the-Art graphics allow instant use of four display colors, and eight lowercase displays featuring descending lowercase letters. You can select from 51, 64 or 85 columns by 21 or 24 lines per screen, with wide or narrow characters in the 64 display. These screens provide a pleasant and relaxing way to perform your tasks, with as much text on the screen as is possible. Each program is easy to learn and a joy to use. We take pride in the stringent testing done to make these programs perform flawlessly. Every feature, every convenience, sleek, simple and elegant.

> *". . . PICTURE getting your instantaneous investment report over the phone, using it in your spreadsheet calculation, generating a report, and writing a memo including that report and data from your database with your word processor, and all this with VIP Library™ programs . . ."*

## Total Compatibility

All **Library** programs are compatible. Transfer and use of files between programs is easy and carefree. What's better, when you have learned one program the others will come easy. And every program is the best of its kind available.

## The Library Programs

For your writing needs is the **VIP Writer™**, and its spelling checker, the **VIP Speller™**. For financial planning and mathematical calculations you can use the **VIP Calc™**. To manage your information and send multiple mailings there is the **VIP Database™**. For sending all these files to and from home or the office and for talking to your friends you can have the **VIP Terminal™**. Finally, to fix disks to keep all your **Library** files in good repair we offer the **VIP Disk-ZAP™**.

## Mini Disk Operating System

The Disk versions each have a Mini Disk Operating System which will masterfully handle from 1 to 4 drives. It offers smooth operation for such features as the ability to read a directory, display free space on the disk, kill files, save and automatically verify files, and load, rename and append files. **Library** programs simply do not have the limitations of BASIC.

## Professionalism

The **Library** will grace your work area with the professionalism it deserves. Welcome the **VIP Library™** into your home and office.

A description of each of the **Library** programs, with the special sale price, is contained in the following pages. Please indulge!

©1983 by Softlaw Corporation

# VIP™ Library

# VIP Writer™

Includes VIP Speller at no additional cost!!

(Formerly Super "Color" Writer II)
By Tim Nelson

**RATED TOPS IN RAINBOW, HOT COCO, COLOR COMPUTER MAGAZINE & COLOR COMPUTER WEEKLY**

The most powerful and easy-to-use word processor is available in the showpiece and workhorse of the **Library: The VIP Writer™**. Because of its undisputed superiority over all Color Computer word processors, it was selected by Dragon Data Ltd. of England and TANO in the U.S., to be the Official Word Processor for their line of Dragon microcomputers.

The result of two years of research, the **VIP Writer™** offers every feature you could desire from a word processor. It is the most powerful, fastest, most dependable and most versatile. With the hi-res display, workspace and compatibility features built into the **Library** the **Writer** is also the most usable.

*". . . Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless . . . Features for the professional, yet it is easy enough for newcomers to master . . . Certainly one of the best word processors available for any computer . . ."* October 1983 "Rainbow"

*"Word processing with VIP Writer is like driving a high-performance vehicle . . . This Ferarri of a package has more features than Telewriter, Easywriter (for the IBM PC), or Applewriter."* October 1983 "Hot CoCo"

The **Writer** will work with you and your printer to do things you always wanted to do. Every feature of your printer can be put to use, every character set, every graphics capability at any baud rate, EVEN PROPORTIONAL SPACING. All this with simplicity and elegance. You can even automatically print multiple copies.

Although all versions feature tape save and load, the disk version provides the Mini Disk Operating System common to the whole **Library**, plus disk file linking for continous printing.

### Professional features of particular note:

- Memory-Sense with **BANK SWITCHING** to fully utilize 64K, giving not just 24 or 30K, but up to 61K of workspace with the rompak version and 50K with the disk version.
- TRUE FORMAT WINDOW allowing you to preview the printed page ON THE SCREEN BEFORE PRINTING, showing centered lines, headers, FOOTNOTES, page breaks, page numbers, & margins in line lengths of up to 240 characters. It makes HYPHENATION a snap.
- A TRUE EDITING WINDOW in all 9 display modes for those extra wide reports and graphs (up to 240 columns!).
- FREEDOM to imbed any number of PRINTER CONTROL CODES anywhere, **EVEN WITHIN JUSTIFIED TEXT**.
- Full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, SEVEN DELETE FUNCTIONS, LINE INSERT, LOCATE AND CHANGE, wild card locate, up to TEN SIMULTANEOUS block manipulations, word wrap around, programmable tabs, display memory used and left, non-breakable space, and headers, footers and FOOTNOTES.
- Automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, and print comments.
- Type-ahead, typamatic key repeat and key beep for the pros, ERROR DETECTION and UNDO MISTAKE features, 3 PROGRAMMABLE functions, auto column creation, and an instant on-screen HELP TABLE.

**32K (Comes with tape & disk) $59.95**

(Includes VIP Speller)

RAINBOW CERTIFICATION SEAL

NEW

# VIP Speller™

RAINBOW CERTIFICATION SEAL

**WITH A 50,000 WORD INDEXED DICTIONARY!**

By Bill Argyros

Gone are the eyestrain, boredom and fatigue from endless proofreading. **VIP Speller™** is the fastest and most user-friendly speller for your CoCo. It can be used to correct any ASCII file — including **VIP Library™** files and files from **Scripsit™** and **Telewriter™**. It automatically checks files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the word in context, with upper and lowercase. **VIP Speller™** comes with a specially edited **50,000** word dictionary which, unlike other spellers for the CoCo, is indexed for the greatest speed. The shorter your file, the quicker the checking time. And words can be added to or deleted from the dictionary or you can create one of your own. **VIP Speller™** also comes with the **Library's** mini disk operating system for easy disk manipulation.

**32K DISK ONLY $39.95**

**Lowercase displays not available with this program.**

# VIP Calc™

RAINBOW CERTIFICATION SEAL

(Formerly Super "Color" Calc)
By Kevin Herrboldt

You can forget the other toy calcs — The real thing is here! No other spreadsheet for the Color Computer gives you:

- **20 ROWS BY 9 COLUMNS ON THE SCREEN AT ONCE**
- **LOWERCASE LETTERS WITH DESCENDERS**
- **UP TO 16 CONCURRENT DISPLAY WINDOWS**
- **FLOATING-POINT MATH**
- **CHOICE OF SINGLE AND DOUBLE PRECISION**
- **WORKS WITH BASE 2, 10, AND 16 NUMBERS**
- **UP TO 512 COLUMNS BY 1024 ROWS**
- **USER DEFINABLE WORKSHEET SIZE FOR MORE MEMORY**
- **LOCATE FUNCTION TO FIND CHECK NUMBERS, NAMES, ETC.**
- **COLUMN/ROW MULTIPLE SORTS**
- **PROGRAMMABLE FUNCTIONS**
- **IMBEDDABLE PRINTER CONTROL CODES**
- **21 ALTERABLE PRINT FORMAT PARAMETERS**
- **ON-LINE HELP TABLES**
- **DOES NOT REQUIRE FLEX OR BASIC**

**VIP Calc™** is truly the finest and easily the most powerful electronic worksheet and financial modeling program available for the Color Computer. Now every Color Computer owner has access to a calculating and planning tool better than VisiCalc™, containing all its features and commands and then some, WITH USABLE DISPLAYS. Use Visicalc templates with **VIP Calc™!**

There's nothing left out of **VIP Calc™**. Every feature you've come to rely on with VisiCalc™ is there, and then some. You get up to **5 TIMES** the screen display area of other spreadsheets for the Color Computer and Memory-Sense with **BANK SWITCHING** to give not just 24, or 30, but **UP TO 33K OF WORKSPACE IN 64K!!!** This display and memory allow you the FULL SIZE, USABLE WORKSHEETS you require. You also get: User definable worksheet size, up to 512 columns by 1024 rows! * Up to **SIXTEEN VIDEO DISPLAY WINDOWS** to compare and contrast results of changes * **16 DIGIT PRECISION** * Sine, Cosine and other trigonometric functions, Averaging, Exponents, Algebraic functions, and **BASE 2, 8, 10 or 16** entry * Column and Row, Ascending and Descending **SORTS** for comparison of results * **LOCATE FORMULAS OR TITLES IN CELLS** * Easy entry, replication and block moving of frames * Global or Local column width control up to 78 characters width per cell * Create titles of up to 255 characters per cell * Limitless programmable functions * Typamatic Key Repeat * Key Beep * Typeahead * Print up to 255 column worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet * Enter PRINTER CONTROL CODES for customized printing with letter quality or dot matrix printer * Combine spreadsheet tables with **VIP Writer™** documents to create ledgers, projections, statistical and financial reports and budgets.

Both versions feature Tape save and load, but the disk version also has the Mini Disk Operating System of the entire **Library**.

**32K (Comes with tape & disk) $59.95**

**32K has no hi-res displays, sort or edit.**

# Check These Library Prices:

- Fully CoCo 2 Compatible
- Nine Display Formats: 32 by 16 51, 64, 85 by 21 or 24
- True Lowercase & Descenders
- Four Different Display Colors
- 32 & 64K Compatible
- Memory Sense - Bank Switching
- Up to 51K Disk, 53K Tape
- Mini Disk Operating System
- Compatible With All Printers

# VIP Terminal™

(Formerly Super "Color" Terminal)

**RATED BEST IN JANUARY 1984 "RAINBOW"**

RAINBOW CERTIFICATION SEAL

By Dan Nelson

From your home or office you can join the communication revolution. The **VIP Terminal™** opens the world to you. You can monitor your investments with the Dow Jones Information Service, or broaden your horizons with The Source or Compuserve, bulletin boards, other computers, even the mainframe at work.

For your important communication needs you've got to go beyond software that only lets you chat. You need a smart termnal so that you can send and receive programs, messages, even other **VIP Library™** files. **VIP Terminal™** has "more features than communications software for CP/M, IBM and CP/M 86 computers." Herb Friedman, Radio Electronics, February 1984.

**FEATURES:** Choice of 8 hi-res lowercase diplays * Memory-Sense with BANK SWITCHING for full use of workspace * Selectively print data at baud rates from 110 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive **Library** files, Machine Language & BASIC programs * Set communications baud rate from 110 to 9600, Duplex: Half/Full/Echo, Word length: 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance.

All versions allow tape load and save of files and KSMs, but the disk version also has the Mini Disk Operating System common to the **Library**.

**32K (Comes with tape & disk) $49.95**

(Tape comes in 16K but without hi-res displays)

Softlaw

9072 Lyndale Avenue So. 612/881-2777
Minneapolis, Minnesota 55420 U. S. A.

TRS-80 is a trademark of Tandy Corp. VisiCalc is a trademark of VisiCorp.

**AUTHOR'S SUBMISSIONS ARE ENCOURAGED.**

# VIP Database™

(Formerly Super "Color" Database)

**INCLUDES MAIL MERGE CAPABILITIES TOO!**

By Tim Nelson

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does so better than any other database program for the Color Computer, featuring machine code, lowercase screens and mailmerge capabilities. Inventory, accounts, mailing lists, family histories, you name it, the **VIP Database™** will keep track of all your data, and it will merge **VIP Writer™** files.

The **VIP Database™** features the **Library** Memory Sense with BANK SWITCHING and selectable lowercase displays for maximum utility. It will handle as many records as fit on your disk or disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numeric order. Records can be searched for specific entries, using multiple search criteria. With database form merge you may also combine files, sort and print mailing lists, print "boiler plate" documents, address envelopes - the list is endless. The math package even performs arithmetic operations and updates other fields. Create files compatible with the **VIP Writer™** and **VIP Terminal™**. Unlimited print format and report generation with the ability to imbed control codes for use with all printers.

As with all other **Library** programs, the **Database** features the powerful Mini Disk Operating System.

**32K DISK $59.95**

64K Required for math package & mail merge

RAINBOW CERTIFICATION SEAL

# VIP Disk-ZAP™

(Formerly Super "Color" Disk-ZAP)

**RAVED ABOUT IN THE APRIL 1983 "RAINBOW!"**

By Tim Nelson

Your database file disk, form letter disk, or BASIC program disk goes bad. An I/O error stops loading, or even backing up of the disk. Weeks, even months of work sit on the disk, irretrievable. Now catastrophic disk errors are repairable, quickly and with confidence, using the **VIP Disk-ZAP™**. It is the ultimate repair utility for simple and quick repair of all disk errors. Designed with the non-programmer in mind, the **VIP Disk-ZAP™** will let you retrieve all types of bashed files, BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to look at the data on your disk. You are able to: Verify or modify disk sectors at will * Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer * Search the entire disk for any grouping of characters * Copy sectors * Backup tracks or entire disks * Repair directory tracks and smashed disks * Full prompting to help you every step of the way * 50-plus page Operators Manual which teaches disk structure and repair.

**16K DISK $49.95**

**Lowercase displays not available with this program.**

VISA

**For Orders ONLY — Call Toll Free —**

MasterCard

# 1-800-328-2737

**Order Status and Software Support call (612) 881-2777**

**Available at Dealers everywhere.**
**If your Dealer is out of stock ORDER DIRECT!**

In Canada distributed by Kelly Software Distributors, LTD.
P.O. Box 11932, Edmonton, Alberta T5J 3L1 (403) 421-8003

**MAIL ORDERS:** $3.00 U.S. Shipping ($5.00 CANADA; $10.00 OVERSEAS). Personal checks allow 3 weeks.

**All Disk Programs are also available on 3" Diskettes for the Amdek Color AMDISK-III Micro-Floppy Disk System for an additional $3.00 each.**

©1983 by Softlaw Corporation

# Running Circles Around LOGO

**By Don Inman**
**RAINBOW Contributing Editor**

### Summary Of Round One

My May LOGO/BASIC article compared drawing regular polygons in each language. LOGO emerged from that encounter as the winner. The LOGO program was a simple and efficient procedure that could be customized to draw a regular polygon with any number of sides. In fact, the Color LOGO procedure for regular polygons can be generalized so that the number of sides are input at execution time as shown in the following procedure.

```
TO REGPOLY :SIDES
  COLORSET 1
  CLEAR
  REPEAT :SIDES (FD 10
   RT 360/:SIDES)
END
```

**Color LOGO uses a colon to indicate a variable.**

The generalized program uses the variable *:SIDES* to control the number of repeated lines and the size of the angle that is turned after each side is drawn. To execute the program, the *RUN* mode is accessed. The name of the program and the number of sides are entered as follows:

REGPOLY 5 ENTER ← for a regular pentagon

or

REGPOLY 8 ENTER ← for a regular octagon

---

*(Don Inman is a co-author of a series of booklets for Radio Shack titled* Color LOGO Guide for Teachers. *He is a former teacher and is presently a full-time author with the DYMAX bunch.)*

The length of the sides can also be controlled by an input variable as in the following procedure.

```
TO REGPOLY :SIDES :LENGTH
  COLORSET 1
  CLEAR
  REPEAT :SIDES(FD :LENGTH
   RT 360/:SIDES)
END
```

The important thing to notice is that the length of the Color LOGO procedure does not increase as the number of sides increase. The procedure can remain the same for all regular polygons.

### Round Two — The Circle

Just in case you feel that I "loaded" last month's demonstration in favor of LOGO, I'll switch sides this month and show that BASIC has some advantages over LOGO in some areas of graphics.

The polygon leads naturally to the construction of a circle. A circle can be considered as a polygon with a large number of very short sides. In fact, that is how a circle is usually drawn by the LOGO turtle. Typical circles could be drawn by the following programs.

**LOGO Procedure**

```
TO CIRCLE1
  COLORSET 1
  CLEAR
  REPEAT 36(FD 10 RT 10
END
```

**Note that 36 sides times 10 degrees/side turns a total of 360 degrees.**

**BASIC Program**

```
10 PMODE 4
20 COLOR 0,5
30 PCLS
40 SCREEN 1,1
50 CIRCLE(128,96),58
60 GOTO 60
70 END
```

The circles are approximately the same size, but the LOGO circle is drawn in a much different way than the BASIC circle. LOGO's turtle has a *HOME* position at the center of the screen (128,96). The turtle begins to draw its circle (really a polygon with 36 sides) at the point 128,96. This point is not the center of its circle. The circles drawn by each procedure are shown in Figure 1.

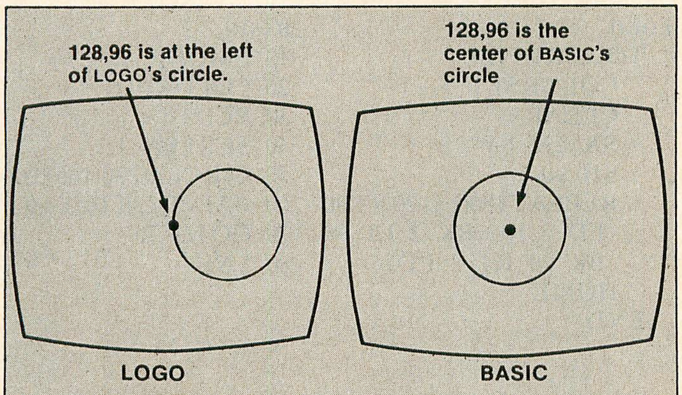

128,96 is at the left of LOGO's circle.
128,96 is the center of BASIC's circle
LOGO
BASIC

Figure 1 — LOGO vs BASIC Circles

The LOGO circle begins at the *HOME* position (the left side of the circle). It consists of a series of straight lines with clockwise turns of 10 degrees. The center of the BASIC circle is 128,96. Therefore, the BASIC circle is centered on the screen. A radius of 58 was used to make the two circles approximately the same size. The LOGO circle starts at the center of the screen but is centered on the right side of the screen.

There is no easy way to predict the exact size of the LOGO circle. Its size is affected by three parameters: the length of the sides; the number of sides; and the size of the turns. Figure 2 shows three examples where the *REPEAT* statement is modified to change the circle's size.

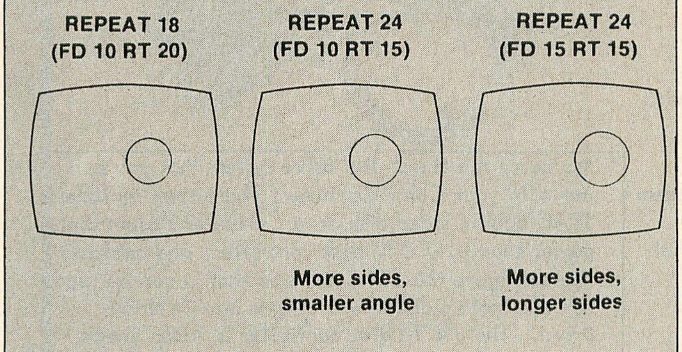


Figure 2 — Changing LOGO Circle Parameters

The size of BASIC circles is affected only by the radius. Figure 3 shows the results of using three different radii in the *CIRCLE* statement.

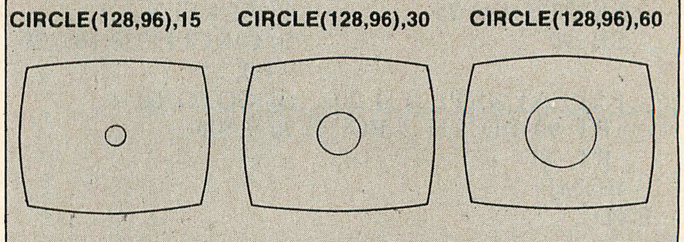


Figure 3 — Changing BASIC Circle Parameters

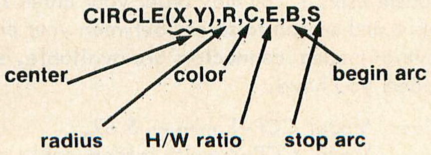
The size of a BASIC circle can be easily predicted from the value of its radius. The size of the LOGO circle is not easily predicted. This becomes important when you wish to place a circle near the edge of the screen or at some precise location on the screen.

There is a second method of drawing LOGO circles that can overcome the lack of size control. This method uses the circle's center and draws a series of short lines at a given distance from the center. However, the circle is drawn very slowly by this method, and the LOGO procedure becomes much more complicated.

```
TO CIRCLE2
  COLORSET 1
  CLEAR
  SX 128 SY 96
  REPEAT 180(PU FD 58 RT 90
   PD FD 2 PU BK 2 LT 90
   BK 58 RT 2)
END
```

The turtle is placed by the *SETX (SX)* and *SETY (SY)* commands. The *REPEAT* loop is executed 180 times, once for each two degrees in the circle. The turtle's pen is raised. It then moves forward 38 units (the radius). The turtle turns right 90 degrees and the pen is lowered. A short two unit line is drawn. Then the pen is again raised, the turtle moves back two units and turns left 90. It then moves back 58 units to the center of the circle. The turtle then turns two degrees in preparation for the next cycle of the *REPEAT* loop.

The BASIC *CIRCLE* command is much more versatile than the LOGO methods for drawing a circle. BASIC changes the eccentricity (height to width ratio) and can also be modified to draw only a part of a circle (an arc).



Here are programs that compare Color LOGO and BASIC methods for drawing an arc near the lower right corner of the screen.

**LOGO**

```
  TO ARC
    COLORSET 1
```

**BASIC**

```
10 PMODE 4
20 COLOR 0,5
```

```
  CLEAR
  SX 230   SY 25
  SH 90

  REPEAT 45(PU FD 20
   RT 90 PD FD 2 PU
   RT 2)
  HOME
END
```

```
30 PCLS
40 SCREEN 1,1
50 CIRCLE(230,165),20,
0,1,0,.25
60 GOTO 60
70 END
```

When the BASIC program is run, the circle appears immediately on the screen. The Color LOGO program takes several seconds to draw its arc. Also notice that a new command *SETHEADING (SH)* was used to point the turtle in the correct direction before starting the *REPEAT* loop. The *HOME* command at the end of the program returns the turtle to its *HOME* position. Both programs produce an arc that looks like that of Figure 4.

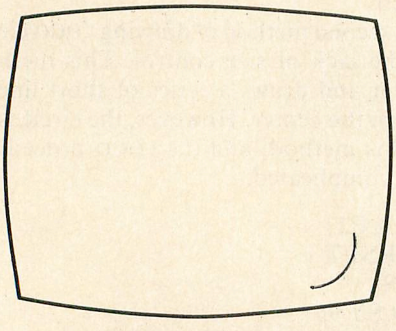


**Figure 4 — An Arc by LOGO or BASIC**

Last of all, BASIC can readily fill a circle with color by the *PAINT* statement. LOGO has no similar command. The best it can do is not lift its pen in the *REPEAT* loop. Each radius is drawn to provide the color. The following programs draw a circle in the lower right corner of the screen and fill it with color. The BASIC program executes immediately. The LOGO execution requires approximately 22 seconds.

**LOGO**

```
TO CIRCFILL
  COLORSET 1
  CLEAR
  SX 230 SY 25
  SH 90
  REPEAT 180(FD 20 RT 90
   FD 2 PU BK 2 LT 90
   BK 20 RT 2 PD)
  HOME
END
```

**BASIC**

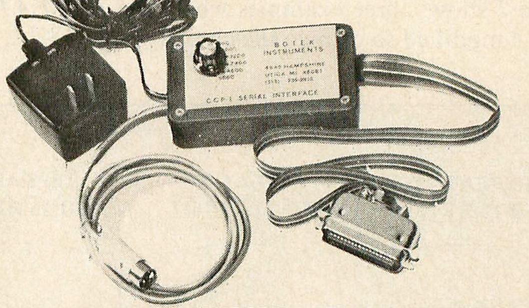
```
10 PMODE 4
20 COLOR 0,5
30 PCLS
40 SCREEN 1,1
50 CIRCLE(230,165),20
60 PAINT(230,165),0,0
70 GOTO 70
80 END
```

Note: The LOGO screen is numbered in the reverse order from BASIC. Y values run from 0 at the bottom of the screen to 191 at the top. This conforms to the standard method of numbering Quadrant I of the Cartesian Coordinate System.

PARALLEL PRINTER INTERFACE

FOR THE RADIO SHACK COLOR COMPUTER

- Runs any parallel printer from the Color Computer serial I/O port.
- No hardware modifications or software patches needed. Works with all standard Color Computer commands including graphics.
- Switch selectable baud rates from 300 to 9600.
- All cables and connectors included.
- Most printers supply power at the parallel port. With these printers you may order your interface without the power module. Printers that require the power module are: Epson, Panasonic, Smith-Corona TP1, Centronics, and Mannesman Tally.
- Modem users ! You may order your Botek interface with a modem cable and switch to select between your printer and modem. Several modem connectors are available, so please tell us what modem you have.
- Price: Model CCP-1 ------ $ 69.
  Model CCP-2 -with modem cable and switch--- $ 84.
  Either model without power module deduct --- $ 3.
  Shipping costs included in price.
  Michigan residents add 4% sales tax.
- 1 year warranty.



* We carry the finest disk drive system that you can use with your Color Computer. The system includes: TEAC double sided disk drive, drive enclosure and power supply, J & M disk controller, and cable. We configure the TEAC drive so that it can be used as two single sided drives or as a double sided drive. The J & M disk controller is Radio Shack compatible ------ $ 425.

* PRINTER SPECIALS *
C-itoh Prowriter plus CCP-1 ----- $ 389.
Gemini 10X plus CCP-1 --------- $ 339.

Order from:

BOTEK INSTRUMENTS

313 739-2910
4949 HAMPSHIRE, UTICA, MICH., 48087
Dealer inquiries invited

# Computers In Education: Projecting The Future Through Research

**By Michael Plog, Ph.D.**
**RAINBOW Contributing Editor**

There are times when it is a good idea to fall back and regroup. It seems to me that time has arrived for those interested in computer education.

The situation is rapidly changing in American education. As we approach the end of this school year, we can see some differences from the end of last school year. First, there is much more educational software available for schools than this time a year ago. This past week, I attended a conference for educational use of microcomputers. In past such conferences, attending dealers were mostly (or completely) selling hardware. This conference was different; every booth included educational software, whether or not hardware was being demonstrated. The Radio Shack booth, for example, not only had a Color Computer on display (with a disk drive attached), but also had educational software, including the teacher's guide to Color LOGO.

Second, people involved with computer education are changing. There are fewer people "wanting to get into computers." You know this type of person — willing to admit their ignorance, and wanting to learn as much as possible about computers before buying anything for their schools. Instead, there are many more people who have a machine (or multiple machines), and are looking for things to do with them. Also, school people are becoming more experienced about microcomputers. You have more teachers expressing their wants in technical terms and more administrators talking about needs for software than in earlier times.

At some point, we are going to face the question of what impact computers have made on education. Right now, we cannot discuss that very well; we can only talk about potentials for the future and point to some outstanding examples of computer use.

How do we go about discussing this question of impact? The first thing to do is gather information about what exists now, in order to compare that to what will exist in a few years. In more technical terms, we need to start collecting "baseline" data. We need information about schools who have no microcomputers, so we can determine what changes will have happened after computers are introduced. We need information about schools and students with limited access to microcomputers, and then see what happens when that access is widened to include more students. That is what is meant by falling back and regrouping.

As an example of one potential research study, consider the uses of microcomputers. When the first microcomputer is purchased for a school, what is it used for? What about the second? The tenth? Are there similar patterns of uses of computers across schools? In addition to what uses are made of computers in schools, we should examine who uses computers. When the first microcomputer enters a school, is it used by students, teachers, administrators, or clerks?

Another research topic might be related to tasks students do in classes. Since there will probably not be a major increase in the amount of time students spend in school, the time they spend on a microcomputer will be taken from time they currently spend on something else. What gets lost when computers are found? What are teachers putting aside in favor of having students work on a microcomputer? Or, a more difficult question: What should be put aside? Consider for a moment the LOGO program. There is no similar task for students in a pre-computer curriculum. Well, something has to be given up in favor of time spent on LOGO.

---

*(Michael Plog received his Ph.D. degree from the University of Illinois. He has taught social studies in high school, worked in a central office of a school district, and currently is employed at the Illinois State Board of Education.)*

Some computer enthusiasts make broad claims for the insertion of computers in education. Self-concept of students will be increased, because of the mastery of humans over machines. Finally, here is a perfectly patient instructor who does not get mad at students, who does not care how many wrong answers are given before the right one, who can become the ideal teacher. Is it true? Does self-concept increase among students learning from a microcomputer? Does self-concept decrease? Maybe it stays the same?

There is a similar argument about attitudes toward school. With a better self-concept and a more interesting form of instruction, students should develop better attitudes about school. I have even heard some computer enthusiasts claim that the introduction and use of micros will improve attendance rates and the volume of extra work by students. Is this true? Do students exposed to microcomputers demonstrate more positive behaviors toward school?

An entire host of other questions revolve around the different rates of acceptance of and access to microcomputers. What little research exists does point out some basic inequalities of interest and exposure. Boys tend to be more interested in (and have greater exposure to) microcomputers than girls. Why is this? As computer knowledge becomes more accepted as necessary for "an educated person," will this change?

We also know that racial and income variables play a role in access to microcomputers. Blacks tend to have less access than whites. Affluent students have more access (at school and home) than their poorer counterparts. Are these differences due only to income differences of schools? Since microcomputers cost some money, it is easily understood why wealthier schools will have microcomputers before relatively poorer ones. With increasing importance being placed on the role of microcomputers in education, will this change?

Of course, there is always the big question: What software packages contribute the most to student academic achievement?

There are a host of other questions that can be asked about computer uses in education. Do students in rural schools approach computers differently from those in urban schools? Well, it is time to stop this part. The questions could continue indefinitely.

Now, why are the above questions important to ask? After all, is it not enough that computers get into schools? No, it is not enough. The educational community will have to justify itself and be accountable to the general public, especially on the topic of computers in schools. Since American education is a public concern, everyone in the educational community has a responsibility to seek answers to questions on accountability.

What can you do about all this? You, dear reader, can become a researcher of sorts. Please do not run out and take all the graduate courses you might need to qualify as a professional researcher. That is simply wasteful. You can, however, develop some questions that have interest for you. Then, start collecting that background data necessary for comparison with future data.

An ideal place to start is with a school that is just beginning to install microcomputers, or at the planning stage. Take notes on things you think will change after computers are introduced. Go to other people in the school system to get their ideas about what may change. After you get a list of items, think about which ones are most probable to change, and the ones least probable to change.

Next, keep a log, a journal. As computers are introduced into classes, take notes about the experiences in the room. Record what students use the machines, how they are used, and reactions from students, teachers, administrators, parents, and anyone else involved. Make sure you record notes at least once a week.

After a while, a review of your notes will provide some impressive insights into not only the computer applications, but your school. You may have some strong interpretations about your information. Go to a professional researcher and share your notes. A professional viewpoint can be helpful at any time during the process; the earlier, the better.

Just because you are taking notes in a journal, do not think you are not engaging in real research. Remember, Margaret Mead started this way — taking notes about her experiences in an unknown South Pacific island. Who knows, you may even get a best-selling book out of the process!

This process, if you decide to do it, may not contribute to educational research in a major way. You may fail to record all relevant facts; you may ignore things that would be important later. Even if you do not end up with a document that aids educational research, you will certainly increase your own understanding. If this process aids your education, then it is worthwhile. There is no more important student than you!

* * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * *

L O S * A N G E L E S *

*** SOFTWARE ***

*Bertamax, Inc. (Educational)*
*Cheshire Cat (Graphicom +)*
*Computerware (All)*
*Custom Software (No Disc.)*
*Frank Hogg Labs (OS-9 & Flex)*
*Key Color Software (Key 264K)*
*Tom Mix (All)*
*Petrocci Freelance (All)*
*Platinum Software (!)*
*Prickly Pear (All)*
*Silicon Rainbow (BBS's +)*
*Soft law (VIP & Colorquest)*
*Speech Systems (All)*

EDC®

*** E.D.C. INDUSTRIES ***

**Software • Hardware • Support**
**Educational • Small Business • Games**

CALL TO VISIT OFFICE
VOICE (213) 258-6593 10 A.M.-10 P.M.
BBS (213) 258-0640 24 HRS.

**POST OFFICE BOX 42718**
**LOS ANGELES, CA. 90050**

DISCOUNTS—OFF LIST
Games -15% Other -10% Hrdwre. Call
CA Res. plus 6.5% Tax. Include $2.00 S & H for mail order.

*** HARDWARE ***

GREAT DISCOUNTS ON:

*Diskettes*
*Drives*
*Monitors*
*Printers*
*Modems*
*Interfaces*

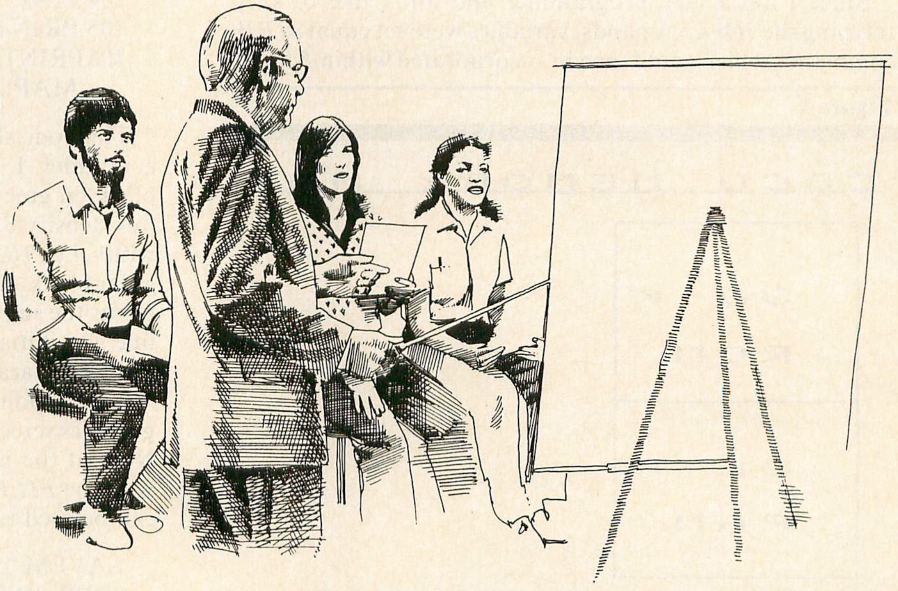
*From :*
*Amdek*
*Basic Tech.*
*EMS*
*Gorilla*
*Speech Systems*
*Zenith*
*J & M Systems*
*Gemini*
*Hayes*
*Novation*
*PBH*
*Many More*

CALL US LAST!

L O S * A N G E L E S *

* * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * *

# Visual Aids By CoCo



By Donald D. Dollberg

In Cincinnati we are very fortunate to have a large and viable computer club for Radio Shack machines — the Cincinnati TRS-80 Users Group, CINTUG. Within this group, which covers all RS computers, it is necessary to have a number of small special interest groups (SIGs). The Color Computer SIG meets monthly on an informal basis. Recently, we were discussing future programs and decided that it was time to have a discussion on 64K applications. I decided that it was also time to add some pizzazz to our meeting by using my CoCo to prepare some visual aids as well as to assist in the presentation.

Using a computer for "slide" preparation and as a super slide projector may not be cost effective considering the low cost of commercial slide production and slide projectors. However, it is much easier to prepare slides with CoCo since our little friend is usually a very forgiving fellow, allowing mistakes to be easily corrected as opposed to those produced with India ink. What I would like to do in this article is to show you some of the techniques I used to prepare some visual aids and a simple procedure for presentation which rivals the old slide projector.

One of the first requirements for this project is the need to combine text and graphics on the same screen. Now there is nothing new about this. A number of articles over the past years have presented character generators written in either BASIC or machine language which allow the user to place text and graphics on the Hi-Res graphics screen. Recently, several screen enhancement utilities have appeared on the market which provide this and additional capabilities. For my project, I decided to use *Rainbow Writer* (Rainbow Connection Software) which I obtained hot off the presses last spring at the Chicago RAINBOWfest. By the way, if you have the opportunity to attend a RAINBOWfest, do so. It's a must!

*Rainbow Writer (RW)* was reviewed in the October issue of THE RAINBOW and I suggest that you check this review. However, since this article is an application of *RW* and BASIC programming, a brief discussion on *RW* capabilities and commands is in order.

First, let me note that *RW* is not a word processor, but a screen enhancement utility with a number of powerful features which include: 1) twelve character densities from 64 chars./line by 24 lines to 16 chars./line by 8 lines; 2) functions in all *PMODES,* i.e., one can print characters in different colors depending on the *PMODE*; 3) supports artifacted colors in *PMODE 4*; 4) underlining; 5) superscripts and subscripts; and 6) top and bottom scroll protect. As I noted above, *RW* is a screen enhancement utility and not a printing utility; however, with a good screen print utility which functions in all *PMODES*, hard copies of the screens can be printed, c.f. Figures 1-3. The hard copy can then be used to make overhead transparencies if it is inconvenient to use the computer for the presentation.

For you memory conscious folks, *RW* requires about 4.5K of memory for itself and an additional 6K for the graphics screen. On a 16K machine, this is extremely limiting, but on a 32K machine about 18K is available for BASIC. On a 64K machine, *RW* really shines. *RW* sets CoCo to the 64K RAM mode, moves BASIC to RAM and relocates itself above Disk BASIC; hence only 6K of low memory is taken up for the graphics screen leaving about 22K for programming.

Enough said by way of introduction. Let's get on with the programming. Since this program is a rather specific application requiring the *RW* utility, I have not included a listing of the full program. I think it is better to show the techniques used for this project than to list the full program.

To use *RW* it is necessary to understand the relatively simple command structure. *RW* commands are issued with *PRINT* statements followed by *CHR$(27)* and an *RW* command. For example:

```
PRINT CHR$(27) + "RW command"
PRINT CHR$(27) + "DNH."
```

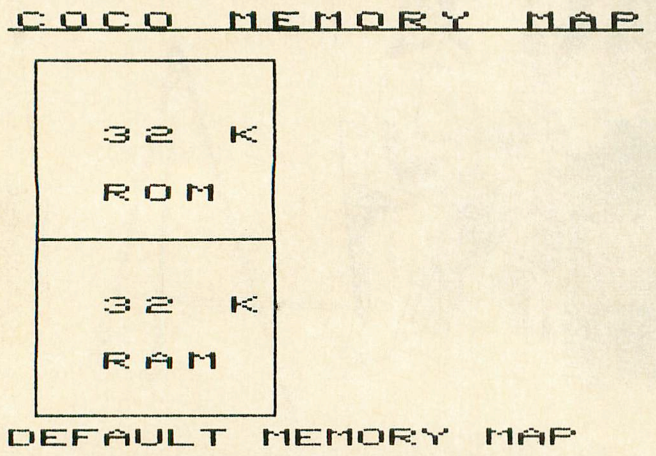
---

*(Donald D. Dollberg, a commissioned officer in the U.S. Public Health Service, holds a Ph.D. in inorganic chemistry. With Richard A. White, he is co-author of* TIMS *— a database management program.)*

This command sets the high density mode of 42 characters per line whereas PRINT CHR$(27) + "DNL." sets the low density of 32 characters per line. NOTE: the *RW* mode for 51 and 64 characters per line was not used because of the need for larger letters for the slides.

Since I am a lazy programmer and don't like to keep retyping the *RW* commands, variables were set equal to *RW* commands which could then be incorporated within *PRINT* statements. The following lines at the beginning of our program set up the needed *RW* commands:

**Figure 1**



```
10 ES$ = CHR$(27):
11 DH$ = ES$ + "DNH.": REM 42 CHARS./LINE
12 DL$ = ES$ + "DNL.": REM 32 CHARS./LINE
13 UN$ = ES$ + "UN." : REM UNDERLINE ON
14 UF$ = ES$ + "UF." : REM UNDERLINE OFF
15 DW$ = ES$ + "DWN.": REM DOUBLE WIDTH
CHARS.
16 DF$ = ES$ + "DWF.": REM DOUBLE WIDTH
OFF
```

Using our defined variables we can easily print on the graphics screen. Suppose we want the title of our slide to be "CoCo MEMORY MAP" printed in double-width characters and underlined. The following *PRINT* statement will accomplish this:

```
PRINT @2,DH$;DW$;UN$;"COCO MEMORY MAP"
;UF$;DF$
```

Note that after printing the title we turned the underlining off and returned to normal characters. Of course, this is only necessary if a change in the character density is desired. If no change were made, then all subsequent *PRINT* statements would result in underlined double-width characters.

During the early stage of this project, I decided that it would be easier and faster if I had an input program which prepared a slide and saved the slide to disk rather than have the audience have to sit and watch the computer draw each slide. Therefore, a second program, the presentation program, was used for the talk. For the remainder of this article, I will discuss some techniques used for the slide preparation and the slide presentation.

Let's begin our slide preparation by drawing the simple block diagram Figure 1, which I call CoCo's default memory map. The following code will produce the figure:

```
100 PMODE 4: COLOR 0,1: PCLS 1
100 PMODE 4: COLOR 0,1: PCLS 1
101 PRINT DW$;DL$;UN$;:
    PRINT@3,"COCO MEMORY MAP";UF$
102 LINE (10,170)-(100-20), PSET, B
103 PRINT@ 66, "32 K";: PRINT@ 98, "ROM"
104 LINE (10,95)-(100-95), PSET
105 PRINT@ 162, "32 K";: PRINT@ 195, "RAM"
106 PRINT DH$;:PRINT@ 462, "DEFAULT MEMORY
    MAP"
```

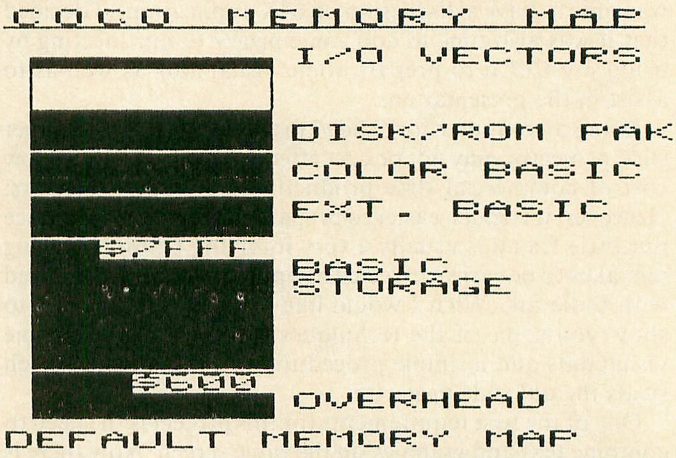
This code should be self-explanatory but some comment is in order. Line 100 sets up the Hi-Res screen for printing black on green background. Line 101 prints the title in the low density 32 characters per line mode but with double-width, i.e.; 16 characters per line. Line 102 draws the rectangular block. Lines 103 and 105 do the labeling while line 106 prints the subtitle. Note that the high density characters per line was initiated still with double-width characters, which gives 21 characters per line.

At this point the slide can be saved to disk by saving the graphics screen, i.e., SAVEM "SLIDE.PCT", 3584, 9727, 0. Note, if the number of disk file buffers has been changed with the *FILES* command, then the following general form can be used to save the slide:

```
SAVEM "SLIDE.PCT", PEEK(&HBA)*256+PEEK(&
HBB), PEEK(&HB7)*256+ PEEK(&HB8)-1, 0
```

Figure 2 is obviously an elaboration of Figure 1 but certainly not a complete memory map. One approach that I like for slide presentations is to present a diagram in parts rather than throw the whole picture up at once. This is somewhat difficult with 35mm slides, relatively easy but cumbersome with overhead transparencies, but a snap for CoCo. The following code begins with the conversion of Figure 1 to Figure 2:

**Figure 2**



```
150 LINE (10,170)-(100-20), PSET, BF: PRINT DH$;
155 LINE (10,150)-(100,150), PRESET:
    PRINT@ 429, "OVERHEAD": PRINT@403,
    "$600"
```

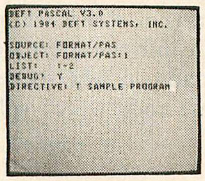
Line 150 "blanks" our memory map with the foreground color — black — and sets *RW* in the 42 character/line mode. Line 155 prints a green line at approximately 600 Hex. Continuing in this way completes the memory map with the one additional item — the area above Disk BASIC is to be painted in the background color — green — using the fol-

# Learn Pascal

## DEFT™ **Pascal** *Now* Supports **Full Pascal** Language
## Use All Your Memory Without OS-9 And **Save**

### DEFT **Pascal** Includes

**Full Pascal Compiler (Version 3.0)**



```
DEFT PASCAL V3.0
(C) 1984 DEFT SYSTEMS, INC.

SOURCE: FORMAT/PAS
OBJECT: FORMAT/PAS:1
LIST:    1-2
DEBUG?  Y
DIRECTIVE: 1 SAMPLE PROGRAM
```

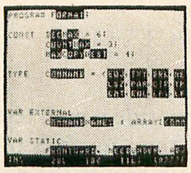
Supports Full Language.
Code In English-Like **Pascal.**
Execute In Fast Machine Code.

**Object Linker** — Lets You
Divide And Conquer Your Programming Problems. **Linker** Combines Multiple Program Objects Into One Binary Program. Easy to use.

DEFT **Pascal** Comes With Complete User Documentation For
**Only $\$79^{95}$**

### DEFT **Doc**
Personalized Letters, Term Papers, Reports, Software Documentation, Articles, Mailings, Etc.

**DEFT Edit** — Full Screen Editor



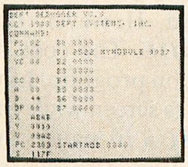
Add And Delete Characters And Lines.
Get And Write Files.
Move Blocks Of Text.

**Text Formatter** — Performs
Table of Contents Generation, Right And Left Justification, Pagination And Decimalization, Automatic Text Insertion, Headers And Footers And **More.**

DEFT **Doc** Comes With Complete User Documentation For
**Only $\$39^{95}$**

### DEFT **Bench** Simplifies Software Development

**Symbolic DEFT Debugger**



Let's You Debug Machine Programs In English, You Don't Have To Be A 6809 Machine Wizard With Prompted Commands.
DEFT **Edit** Full Screen Editor

**Macro Assembler** — Supports
Entire 6809 Instruction Set. Macro Facilities Let You Define Your Own Instructions. Supports Pascal Interfaces. Easy To Use.
**Object Linker** (See DEFT **Pascal**)

DEFT **Bench** Comes With Complete User Documentation For
**Only $\$49^{95}$**

### Order DEFT **Pascal** And DEFT **Bench** Together
### **(Colour Software Workbench)**
And Get **FREE** Source Files to a **Text Formatter**
**Only $\$119^{95}$**

Here's What Frank Esser of The RAINBOW Magazine Says About DEFT Version 2 Software:
"The whole package is quite impressive."

"I am totally impressed with the professional quality of both the programs and the documentation. They are, in my opinion, excellent."

". . . includes all the necessary tools for the serious programmer to produce good programs with a minimum of effort. For those who are not familiar with Pascal, I think it provides an excellent environment to learn in."

**Develop efficient programs more easily, or help someone *prepare for college.*** All you need is DEFT software and a TRS 80 Color Computer with Extended Disk Basic, at least 32K of RAM, and One Disk Drive.

DEFT Question Line
(301) 253-1300

VISA

For Credit Card Orders Call Toll Free
**1-800-368-3238 Operator 8**
In Virginia
**1-800-542-2224 Operator 8**
Or Fill Out Our Order Coupon

DEFT Question Line
(301) 253-1300

master charge

"TRS-80" and "Color Computer" are Trademarks of TANDY Corporation

DEFT and **Colour Software Workbench** are Trademarks of DEFT Systems, Inc.

Enter Quantities of Each Item: ____ DEFT **Pascal** ____ DEFT **Doc** ____ DEFT **Bench** ____ **Color Software Workbench**

Method of Payment (check one) ☐ Check Enclosed. ☐ Visa ☐ Master Card

Account Number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiration Date ☐☐ / ☐☐

Signature ____________________

Name ____________________

Street ____________________

City ____________________ State ____________________ Zip ____________________

Add 3% for shipping and handling; Maryland Residents add 5% State Sales Tax and Mail To:
DEFT Systems, Inc., P.O. Box 359, Suite 4, Damascus Centre, Damascus, MD 20872

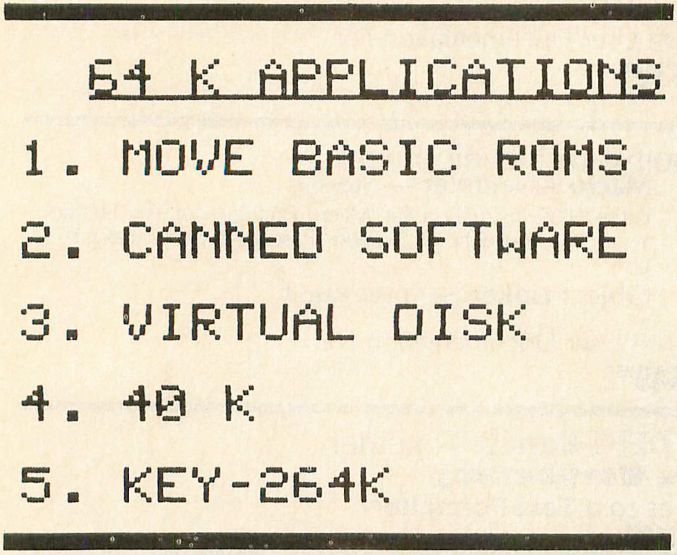
lowing code:

```
160 LINE (10,41)-(100,41),PRESET
161 LINE (10,25)-(100,25),PRESET
162 PAINT (50,20), 1, 1
163 LINE (10,25)-(10,41), PSET
164 LINE (100,25)-(100,41), PSET
```

Lines 160 and 161 draw green lines at the top of Disk BASIC and the bottom of I/O vectors, respectively. Line 162 paints the area between these lines with "green paint" and lines 163-164 draw two vertical black lines to complete the map.

It is often useful to have title slides which show the audience the various topics which will be covered in the presentation. I like to have several such slides which are placed before each topic. Figure 3 is an example of a title slide which tells the audience the next five topics to be covered. This slide can be placed at the beginning of each topic with the topic to be discussed next highlighted in a different color. For example, topic 1 could be printed in yellow while topics 2-5 printed in black. This is easily accomplished with *RW* since all you need do is change the foreground color with the Extended Color BASIC command. You will also note that the print size is much larger than the previous slides. This is accomplished by switching to *PMODE 1*. Obviously, *PMODE 3* could also be used but this would result in smaller letters but better resolution.

**Figure 3**



64 K APPLICATIONS

1. MOVE BASIC ROMS

2. CANNED SOFTWARE

3. VIRTUAL DISK

4. 40 K

5. KEY-264K

Now that we have some procedures for making slides, let's move on to the presentation. We need an easy means of controlling our "slide show." Personally, when I give a presentation, I don't like to be confined behind a podium, so I obviously don't want to be restricted to the keyboard for controlling the slides. The obvious solution is to use the joystick (there are other uses for this device besides games) fire button to control the slide changing. Memory location 65280 indicates the status of the fire button. If it contains 255 then neither fire button has been pressed. A value of 254 indicates that the right button has been pressed while 253 indicates that the left button has been pressed. Therefore, a simple subroutine can be constructed which will pause the program until the fire button is pressed:

```
10 IF PEEK(65289) = 255 THEN 10 ELSE RETURN
```

A *GOSUB10* can be placed anywhere in the program where a pause is needed. Purists will note that either fire button will cause the program to continue but it should be obvious that only one joystick will be used for the presentation.

Now that we have a disk full of slides how do we present them? The easiest way is to simply do a *LOADM "SLIDE.PCT"* at the appropriate time. But, there is a better and more elegant way. Since CoCo provides two Hi-Res graphics screens we can simply load a slide into one screen while we discuss a slide on the other graphics screen. *RW* is set up in essentially *PMODE 4,1*. To load a slide into the alternate graphics screen simply do an offset load, i.e., *LOADM "SLIDE.PCT", 6144*. Let's look at some code which will illustrate the entire process.

```
  1 GOTO 300
 10 IF PEEK (65280) = 255 THEN 10 ELSE RETURN
 20 FOR I = 5 TO 8: PCOPY I TO I-4: NEXT
300 LOADM "SLIDE1.PCT", 6144: GOSUB10
310 PMODE 4: COLOR 0,1: PCLS 1
320 GOSUB20: LOADM "SLIDE2.PCT", 6144
330 GOSUB 10
```

As we noted earlier, line 10 is our subroutine which tests the status of the joystick fire button and thus controls our slides. Line 20 is another subroutine which moves the previously loaded slide from the alternate graphics screen to the current screen. NOTE: in *PMODE 4* there are four graphics pages per graphics screen; hence the need for the *FOR-NEXT* loop with the *PCOPY* command. However, this subroutine can be used with any *PMODE*. The code at 300-330 is representative of the presentation program. Line 300 loads a slide into the alternate graphics screen while the current slide is being discussed. The *GOSUB 10* pauses the program until the next slide is needed. Line 310 sets the correct *PMODE*, foreground/background colors and clears the screen. If all the slides are in the same *PMODE* then this line is not needed. (By the way, some very interesting effects can be achieved by placing a *PMODE 4* slide in a lower *PMODE*.) With the screen cleared line 320 calls the slide move subroutine and then loads the next slide into the alternate graphics screen. Again, a *GOSUB 10* in line 330 pauses the program. Lines 300-330 can be repeated as often as necessary.

With the above technique a very smooth presentation can be achieved. In some cases, it might be advantageous to add additional material to a previously prepared slide during the presentation. This can be done by incorporating the necessary code after the slide has been moved to the graphics screen but before the next slide is loaded to the alternate screen. The code shown earlier which transformed Figure 1 to Figure 2 is such an example which was kept in the presentation program.

By now the reader should be aware that it is a relatively easy task to prepare visual aids with CoCo. Even without the aid of utilities like *Rainbow Writer*, good slides can be prepared through the use of BASIC or ML character generators which use the Hi-Res graphics screen. But, the reader can easily see that utilities such as *RW* greatly facilitate the project and add much more capability. I must admit that this project was my first real use of CoCo's graphics. Those of you who are much more into graphics are aware of many additional techniques. If this article has caught your fancy then I suggest you look at the many excellent graphics articles which have appeared in THE RAINBOW

16K
ECB

*Place these new DATA values into Larry Konecky's Composer (December '83) and you'll be in clover as well as musically 'entertained.'*

# Two for the *Composer*

### By Brad Scoffin

These two listings are actually values of *DATA* for songs that I have typed into the CoCo with the use of the *Composer,* written by Larry Konecky and published in the December issue of THE RAINBOW.

*Clover* is a rendition of "Looking Over A 4-Leaf Clover" and was particularly interesting to me because of its use of cords. *Joplin* is a rendition of "The Entertainer," by Scott Joplin.

For each I have given a decimal dump of the memory values, beginning with the length of the notes and then followed by the four notes. You must use the composer to enter in the data values, and then save the music to tape or disk for later recall.

Before *RUNing Composer* the speed must be reset for each song. The speed for *Clover* must be set by changing the last *DATA* value in line 5010 from 104 to 80. For *Joplin* the speed must be set at 100.

I hope you enjoy the songs and *thank you* Mr. Konecky for the great CoCo Composer. I really enjoy it!

**Joplin**

```
10 , 0 , 54 , 0 , 0
3 , 0 , 0 , 0 , 0
10 , 0 , 56 , 0 , 0
3 , 0 , 0 , 0 , 0
10 , 0 , 58 , 0 , 26
3 , 0 , 0 , 0 , 26
10 , 74 , 0 , 0 , 26
10 , 74 , 0 , 40 , 34
3 , 0 , 0 , 40 , 34
10 , 58 , 0 , 40 , 34
3 , 0 , 0 , 0 , 0
21 , 74 , 0 , 0 , 40
3 , 0 , 0 , 0 , 40
10 , 0 , 0 , 50 , 46
3 , 0 , 0 , 50 , 46
10 , 74 , 0 , 50 , 46
3 , 74 , 0 , 0 , 0
24 , 74 , 0 , 36 , 0
24 , 74 , 0 , 50 , 44
3 , 74 , 0 , 0 , 0
10 , 74 , 0 , 0 , 34
3 , 0 , 0 , 0 , 34
10 , 74 , 0 , 0 , 34
3 , 0 , 0 , 0 , 34
10 , 78 , 0 , 58 , 50
3 , 0 , 0 , 58 , 50
10 , 80 , 0 , 58 , 50
3 , 0 , 0 , 0 , 0
10 , 82 , 0 , 40 , 0
3 , 0 , 0 , 40 , 0
10 , 74 , 0 , 40 , 0
3 , 0 , 0 , 40 , 0
10 , 78 , 0 , 58 , 50
3 , 0 , 0 , 58 , 50
10 , 82 , 0 , 58 , 50
3 , 82 , 0 , 0 , 0
10 , 82 , 0 , 40 , 0
3 , 0 , 0 , 40 , 0
10 , 72 , 0 , 40 , 0
3 , 0 , 0 , 40 , 0
21 , 78 , 0 , 60 , 48
3 , 0 , 0 , 0 , 0
21 , 74 , 0 , 58 , 54
3 , 74 , 0 , 0 , 0
21 , 74 , 0 , 40 , 0
3 , 74 , 0 , 40 , 0
21 , 74 , 0 , 0 , 26
```

**Clover**

```
21 , 70 , 54 , 0 , 22
3 , 70 , 54 , 0 , 0
21 , 70 , 54 , 0 , 36
3 , 0 , 0 , 0 , 0
21 , 60 , 54 , 0 , 12
3 , 0 , 0 , 0 , 0
21 , 0 , 54 , 46 , 0
3 , 0 , 0 , 0 , 0
21 , 0 , 50 , 44 , 22
3 , 0 , 0 , 0 , 0
21 , 0 , 46 , 40 , 0
3 , 0 , 46 , 40 , 0
21 , 0 , 46 , 40 , 12
3 , 0 , 0 , 0 , 0
21 , 0 , 50 , 44 , 0
3 , 0 , 0 , 0 , 0
21 , 0 , 54 , 46 , 22
3 , 0 , 54 , 46 , 0
21 , 0 , 54 , 46 , 36
3 , 0 , 0 , 0 , 0
21 , 60 , 54 , 0 , 0
3 , 60 , 54 , 0 , 0
21 , 60 , 54 , 0 , 36
3 , 0 , 0 , 0 , 0
21 , 70 , 54 , 0 , 22
3 , 0 , 0 , 0 , 0
21 , 68 , 60 , 54 , 0
3 , 68 , 60 , 54 , 0
21 , 68 , 60 , 54 , 12
```

**Editor's Note: The data files include only the first stanza of each song. Both of the files will be on RAINBOW ON TAPE this month.**

**TAKING BASIC TRAINING**

**16K**

# Creating A Test For The Computer Widow

**By Joseph Kolar**
**RAINBOW Contributing Editor**

In order to stimulate the beginner to create simple programs, let us walk through the evolution of a raw idea into a finished program. It will be a review of what we have learned in the past. This may amuse you, but isn't that the name of the game? Fun! Fun! Fun!

Computer widow! That was the theme that was churning around in my head. Ugh! What a topic! It didn't look promising. The challenge was to create some sort of program using the computer widow as the core idea.

If you have an idea, no matter how obscure, you can develop a plan. If you can dream up a plan (or plot), you surely can build a computer program around the theme. More than that, it is fun to wander off into the rarified atmosphere of unusual programs. One thing for sure! It will be original.

Back to the drawing board! What can be developed? Define the theme. It might result in something like this:

A computer widow is a long-suffering spouse of a husband who is so involved in computing that he spends all of his free time in his computer room, or "nest" to the detriment of his wife, family and chores.

What are some of the things the lady of the house must cope with? Well, our bleary-eyed hero gloms down his breakfast and staggers out the door on a dreary day into the business world. When he returns home, he plops down at the dinner table, mutters sweet nothings to his family, who are eagerly awaiting the "word" from our hero. He flips through computer magazines as he unenthusiastically bolts his food. Then, our hero, wordlessly but gracefully, stalks into the recesses of his nest to vanish for the night.

*(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)*

That sounds like an extreme CoCo addict. And, what about his wife? She may as well do the dishes and switch on the TV set.

Do you get the picture? You now have material to work with. How do you make a program out of it? Some further thought elicits the question, "To what degree is this lady a computer widow?"

Okay! That's it! We will ask her. Let's give her a test. A humorous test that is not to be taken seriously, but a test that makes a point.

> *"To what degree is this lady a computer widow? . . . Let's give her a test. A humorous test that is not to be taken seriously, but a test that makes a point."*

In order to get the lady of the house involved, the idea is to set up a computer program especially for her. Now, our elusive hero can call his better half into this inner sanctum and let her have a bit of fun with the CoCo. She may like what she sees, be appropriately impressed and decide to get involved with computing. What a happy thought! The family that computes together, stays together.

The next thing would be to think of questions that may be unlikely, but seem plausible. Try to give the questions a comical connotation.

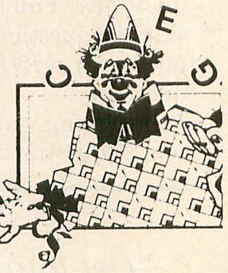
Finally, some kind of score is needed that is impressive, even if it is worthless.

**SEND FOR FREE CATALOG**

TCE™

**Dealer inquiries invited**

## ABC'S IN COLOR



In the ABC program, all 26 letters spring up in color to the familiar ABC tune. Then, colorful detailed pictures depicting each individual letter of the alphabet appear one by one. Your child's fascination will mount as he or she correctly presses the letter on the keyboard and is rewarded with a musical tune before the next detailed picture is drawn line by line onto the screen: AIRPLANE for A, BUS for B, CLOWN for C and so on to ZEBRA for Z. Truly a must program for the preschool to first grade age group!

CoCo 16K ECB . . . . . . Tape: $19.95 Disk: $25.95

## CRISS—CROSS MATH

As the program begins, your child is presented with a nine square playing board. It is your choice as to which square you choose. After a choice is made, a MATH PROBLEM appears in the square. You score your first X by answering the problem correctly. If your answer is incorrect, the square clears and your opponent is allowed his choice of squares. The game is over when three squares vertically, horizontally, or diagonally are won by the same player. When playing against the computer, every answer you get wrong is won by the computer. Multi-level ADDITION AND SUBTRACTION program.

CoCo16K . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $12.95

## FRACTIONS

SIDE ONE: Fraction Lessons, explains fractions with the aid of graphics. Child studies the different ways fractions can be represented. Lessons include:

- IMPROPER FRACTIONS
- MIXED FRACTIONS
- PROPER FRACTIONS

Many educators have praised the use of motion and color to display the fractional equivalents.

SIDE TWO: Fraction practice, offers a random computer generated quiz.

Atari16k . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $19.95
CoCo16k . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $19.95

## JOYSTICK DRAW

Joystick Draw is the simple way to explore your artistic talents! Program operation is easy enough for a child to use, but effective enough that TCE uses it to design many sophisticated high-resolution graphic screens. Joystick Draw's design allows you or your child to save those masterpieces for future revisions or for use in other programs (instructions included). Your child will spend many hours enjoying this program and at the same time improving his or her eye hand coordination! You will find Joystick Draw to be an easy way to design those more sophisticated graphics for your own programs!

CoCo16 ECB . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $16.95

## SPELL BOMBER

As captain of your ship, you must destroy the enemy bomber by spelling the mystery word. In this exciting and educational game the bomber gets closer with each inaccurate letter. You have only EIGHT tries to guess the mystery word or your ship will be bombed! If you guess the word correctly, GENERAL QUARTERS will sound and your ship will fire a missile to destroy the bomber, Three levels are available: EASY, MEDIUM, and HARD. Challenging for all ages!

Atari16K . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $18.95
CoCo 16k ECB . . . . . . . . . . . . . . . . . . . . . . . . Tape: $18.95 Disk: $22.95
Vic 20 13k . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $18.95

## SPELLING BEE

The word is pronounced vocally and it is up to you to type in the correct spelling. If wrong, the computer will be your friend and flash the word on the screen for just an instant. OK! Try typing the word in again. STILL WRONG! The computer wants success and allows you to see the word again this time a little longer. If you just can't spell the word, the computer realizes you need to learn to spell the word and leaves the word on the screen for you to copy. Try your best and the computer has a surprise for your reward!

SPELLING BEE I . . . GRADE 1 & 2 SPELLING BEE III . . . GRADE 5 & 6
SPELLING BEE II . . GRADE 3 & 4 SPELLING BEE IV . . . GRADE 7 & 8

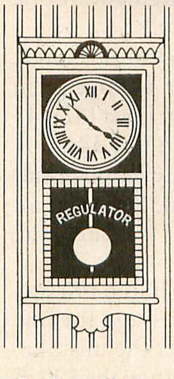
CoCo 16k ECB . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . TAPE: $16.95 Each

## TC—INVENTORY

Many insurance companies offer a discount for policy holders which have complete inventories on file. TC — Inventory is designed to help you organize, maintain, and compile the personal belongings of your home. Program is user friendly and menu driven. TC — Inventory allows input for location of item, price of item, serial number of item, date of purchase, and a text written description of the item. Don't put off recording your personal belongings until its too late. Requires printer for hard copy.

CoCo 32k ECB . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $16.95

## TEACHING CLOCK



Torn between teaching time on a digital or a conventional (face and hands) clock? Well, this program combines the two using high resolution graphics and prompts! Your child will learn to tell time with the aid of a specially designed CLOCK! Child enters the time, if wrong, the center of the clock displays a graphic aid. If the child is correct a musical reward is heard. Program offers three levels: hours, quarter hours, and five minute intervals.

Apple 48k . . . . . . . . . . . . . . . . . . . . . Disk: $19.95
Atari 32k . . . . . . . . . . . . . . . . . . . . . Tape: $16.95
CoCo 16k ECB . . . . Disk: $19.95 Tape: $16.95

MasterCard

**Additional Educational Software available for Color Computer, TDP 100, Atari ®, Apple ®, Commodore 64 ®, and VIC 20 ®.**

VISA

**P.O. Box 2477 Gaithersburg, Maryland 20879 (301) 963-3848**

All we need to do now is to create a program. We can learn from it and use it as a tutorial.

Look at the listing. You may key it in as you read through this explanation. It is good practice to read the listing first. You will get an overview of the entire program and understand what you are keying in. The program was written from the top down in a linear, straightforward manner. Thus, it is very easy to follow and provides a review of material we have previously discussed.

Get into the habit of beginning each program with a *REM* line that indicates the name of the program. This is important when you print a listing of the program. The very first line identifies it. Since it is your program, *REM* in your name and address.

Now, we are in business. Clear the text screen with a program line. Then way down, say at 2000, make a holding loop, *2000 GOTO 2000*, so that you can view that work as you proceed.

Leave line space to add a title card, which should be the last thing you do, after refining and debugging your program. After all, what good is an elegant title card until you have a program to which you can affix it?

Line 100 could just as easily have read *PRINT:PRINT:PRINT*. The rationale was that I did not know how many lines I would skip to vertically center the page. If I wanted to change to four, five, or six lines, it is very convenient to change the numeral and *RUN* it to see if it was satisfactory. Remember, we always want to center our text vertically to present a pleasing visual effect.

We ran out of string space in line 110. Line 110 was ended with a comma. This allows line 111 to follow immediately after the last word in line 110. Notice that it was necessary to put a couple of extra spaces after "HIS" so that "CoCo" would be advanced to the next text line rather than be split between lines.

The next thing was to advance to the next page. I never remember the routines for these simple but necessary items. Fortunately, I keep a notebook chock full of these simple but elusive routines. I looked it up!

Enough spaces were entered in front of "PRESS" in line 112, so that the line would be horizontally centered.

At line 120, we cleared to a new text page and skipped four rows before writing our message on a multi-statement line. You have advanced far enough in your studies to begin using multiple statements. If you feel uncomfortable with them, just use a separate program line for each statement but be careful not to usurp an assigned program line.

Line 140 sends us to a new text page to write our message. It was decided to make a humorous signature. It appears in lines 142-144. You can either space it over as in lines 142-143 or use the *PRINTTAB* statement as shown in line 144.

Line 190 is a *REM* line. Why? Because whatever information was placed in that line earlier was deleted. Rather than delete line 190 and cause a possible UL Error message, the *REM* was put in to hold the line harmlessly.

Suppose that line 145 ended in *:GOTO190*. If line 190 was deleted, you would surely get a UL Error message for line 145. You would have to search out and correct the mistake. The correction might be, among others, to change the 190 in line 145 to 200 — a simple remedy in this case, but not so obvious in more complex programs that might consume a lot of time in locating and correcting the error.

The rule is that when you delete program lines in the midst of a creative session, it is wise to convert the deleted lines into harmless empty *REM* lines.

Now we get a bit nervous. A lot of time has been invested in this program. Put a fresh tape into your recorder and make two or three copies of your work completed thus far. This is another good practice. Every now and then, in a creative session, pause to make a few copies of your work. You never know when the lights will go out and your program is zapped. Remember, there is nothing creative about starting over to reproduce a lost program, however incomplete.

Line 200 gives instructions on answering the upcoming questions. You could have added, "If you are undecided, skip the question." That was kind of redundant because, if no answer is *INPUT* then the computer goes on to the next question.

Beginning with line 300, using increments of 10, we present 20 questions. This line clears to the next text page, skips a line, presents the query and sends the computer to line 4000.

> *"Get into the habit of beginning each program with a* REM *line that indicates the name of the program. This is important when you print a listing of the program. The very first line identifies it. Since it is your program,* REM *in your name and address."*

The 4000 block was assigned for the *GOSUB 4000* routine. Line 4000 was *REMed* to hold it open in case it was needed later. Line 4001 asked for the input and then decided that if the answer was "yes," one point would be added to the "yes" totals. Then it dropped to line 4002 and returned to the next question.

What would happen when the answer is "no" or the question skipped? Or, suppose we added *:RETURN* to the end of line 4001 and deleted line 4002. Why wouldn't this work? Try it and see why it is always best to assign a separate line for *RETURN*. Incidentaly, having a simple *RETURN* line at the end of a routine makes it easy to spot the *GOSUB* routine when reading through a listing.

The *GOSUB* routine came in handy. It allowed us to key in the information in line 4001 only once, rather than 20 times, once after each question.

After listing the 20 questions, line 999 gives the simple formula we will use to determine the final score. The *INT* tells the computer that if the result is an integer plus a decimal, such as 3.5, it will drop the number after the decimal and give the integer as the answer.

Finally, we clear the screen at line 1000, skip a few lines, give the score, 'D', and the final message which is held on the screen by the line 2000 loop.

Suppose that this was a program where you wanted to recycle past the title and opening statements in order to retake the test.

You could add *LINE 1020 FOR Z = 1 TO 4000: NEXT: GOTO 140*. This line would pause so that the test results could be absorbed. Then it would go to the lady's message, making it possible to retake the test. However, there is a fatal flaw. Can you determine the mistake and make the program run properly if you added line 1020?

Note that an effort was made to center all pages vertically to give a centered display. Whether two or three questions were shown on a text page, they were centered. It doesn't cost any more to take a bit of time making a neat display you can be proud of.

Use your sense of humor to dream up other questions we might have asked the lady. Substitute your questions for the ones in the program. Make sure you format the text properly. Center the text pages vertically. If you are ambitious, why not add some color and sound? Make a nice title page that you can fit between lines 10 and 100. Then add line 2, stating that you modified and improved this program, listing your name and address. It is now your program!

Remember, you never know what you can do until you try it! Have fun experimenting and watch your experiments flower into full-blown programs.

141 ........ 56
345 ....... 195
410 ....... 197
END ...... 214

**The listing:**

```
0 'COMPUTER WIDOW
1 '(C) 1983,J. KOLAR
10 CLS
100 FOR I=1 TO 3:PRINT:NEXT
110 PRINT"  THIS IS A LITTLE TES
T THAT IS MEANT TO BE TAKEN BY T
HE LADY OFTHE HOUSE, WHO IS COMP
ETING     WITH THE COLOR COMPUTE
R FOR THE ATTENTION OF HER HUSBA
ND.  WE   CAN ASSUME THAT THE HU
SBAND IS  CLOSETED IN HIS COMPUT
ER ROOM,  DOING ARCANE ";
111 PRINT"THINGS WITH HIS     COC
O."
112 INPUT"          PRESS <ENTER>
";A$
120 CLS:FOR I=1 TO 4:PRINT:NEXT:
PRINT"  IF YOU LIVE DANGEROUSLY,
 IN-  VITE YOUR FAITHFUL WIFE TO
 YOUR 'NEST' TO TAKE THIS TEST.
 BUT, BE FOREWARNED!  THIS TEST
MAY   BE DANGEROUS TO YOUR MARIT
AL    WELL-BEING.
121 PRINT:INPUT"          PRESS <E
NTER>";A$
```

FREE OFFER!

COMPUTER CASSETTES 58¢

*FREE "Great Inventions Game Cassette" with each order of 20 or more C-10's*

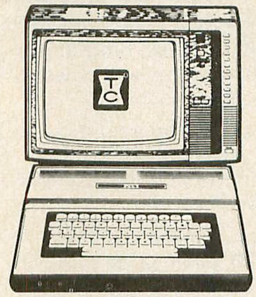
**Specify TRS-80 Color Computer, MC-10, TI-99/4A VIC 20 or Commodore 64**

- C-10 Length
- 5 Screw Shell / Free Labels
- Lifetime money back guarantee
- Storage Box add 12¢ each
- $2.00 shipping charge - any quantity (Canadian Orders $6.00 shipping)
- NJ Residents add 6% Sales Tax.
- Send check or money order to:

PARALLEL SYSTEMS

Box 772 - Dept. R
Blackwood, NJ 08012
609-227-9634

RAINBOW CERTIFICATION SEAL



PROGRAMMERS

TANDY CORPORATION/RADIO SHACK
RESEARCH AND DEVELOPMENT DIVISION

is now seeking assembly language programmers for advanced product development in Home/Personal Computers. The individuals we seek are innovative and resourceful, with progressive ideas about the future of Home Computers.

DESIRABLE AREAS OF EXPERIENCE

- 6809 or other microprocessor
- OS/9 Operating System
- Graphics/Animation
- Music/Sound/Voice
- Productivity Tools
- Game Development
- Home Education

We offer excellent company benefits, competitive salaries, relocation assistance, and a superb development environment, plus Stock Purchase Program and Deferred Salary Investment Plan (with matching company contributions).

Please send resume and salary history (in confidence) to:

Carolynn Gerrick
Technical Recruiter
Tandy Corporation/Radio Shack
500 One Tandy Center
Fort Worth, TX 76102
(817) 390-3536

an equal opportunity/affirmative action employer
principals only please

Tandy Corporation/Radio Shack

# The Software Experts

## COCO COOKBOOK

- Can be used for ANY free-format filing system (not just recipes). Try it for periodicals and article synopsis, product reviews, real estate descriptions,...!
- Store & retrieve a large number of recipes.
- Up to 270 recipes on a single disk using a special compression technique.
- Up to 3040 characters per recipe including title, ingredients, & instructions — all in easy to use "free form" format.
- Access each recipe by title, number, or with special keyword search (like all the recipes using "chicken"!). List on the screen or printer.
- 50 recipes included FREE! **FREE!**
- Requires 32K and a disk drive.

32K Disk **$27.95**

NEW

Computerware introduces

## BASIC PROGRAMMING UTILITIES and PRINT SPOOLER

on cassette and disk for the Radio Shack Color Computer.

This is a real aid to the serious Basic programmer! Following are brief descriptions of the very powerful utilities included in this package.

SPRINT — this printer spooler sets up a print buffer in upper memory (2K in a 32K system or 32K buffer in a 64K system), so you can be printing while other computer operations continue unaffected!

BASREF — this utility prints a complete variable and line number cross reference list for Basic programs. This is really helpful on longer programs!

VDUMP — the values of all the variables in your Basic program are printed by this utility.

CCEXPAND — if you have 64K of memory you can use this combo of the SPRINT utility with a 51 x 24 hi-res screen, a 25K printer buffer, and only use 287 bytes of user memory! Also included is CHAREDIT which is a Basic program that allows you to change CCEXPAND's character set.

FIXDIR — this is a DISK ONLY utility that helps you clean up Basic's disk directory. It gives you an alphabetized directory, program information, and a complete disk map.

Requires at least 32K of memory.

**$19.95** Cassette **$24.95** Disk

## COLOR BASIC COMPILER

If you have ever written a BASIC program only to find that it runs too slow to provide any action and haven't had the courage to learn assembler, then the Color Compiler™ is the answer. It lets you write your program in easy BASIC and then converts it into fast machine language. After you run your compiled program, you may find it necessary to add some delays because the Color Compiler™ will make your program run an average of 40 times faster.

The Color Compiler™ features a total of 55 commands and functions. Most of these are a subset of Extended Color BASIC. The Color Computer is limited to integer variables. All floating point handling can be done in a BASIC program which calls the compiled program. Passing information from BASIC to compiled programs is very easy. The Color Computer™ generates position independent code so that you may put the compiled program anywhere in memory, including into a ROM-pack! It requires 32K and a disk drive, leaving 16K of user work space.

Functions Supported:

ABS
PPOINT
+
<
INKEY$
RND
-
>
JOYSTK
SGN
*
AND
PEEK
SQR
/
OR
PEEK#
TIMER
=
NOT

Instructions Supported:

CIRCLE
DIM
GET
LET
PAINT
POKE
PSET
RESTORE
CLS
END
GOSUB
LINE
PCLS
POKE#
PUT
RETURN
COLOR
EXEC
GOTO
MOTOR (ON/OFF)
PCOPY
PRESET
READ
SCREEN

DATA
FOR-STEP-NEXT
IF-THEN-ELSE
ON n GOTO or GOSUB
PMODE
PRINT
REM
SOUND
USR

NEW

**Great new features added to Color Basic Compiler**

Now our popular Color Basic Compiler has **STRINGS!** You can now enter, manipulate, and compare string values directly from your compiled program.

— **New Commands:**
MID$ LEN CHR$ · STR$
— Commands changed to work with strings:
DATA READ INKEY$ DIM
IF-THEN PRINT PRINT@
— All for the same LOW PRICE of **$39.95!**

COMPUTERWARE®

**P.O. Box 668 • Encinitas, CA 92024**
**Phone: (619) 436-3512**

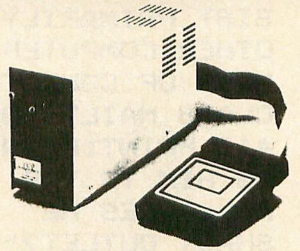
**Computerware is a federally registered trademark of Computerware.**

# have hardware & accessories too!

Largest selection of CoCo Products from One Company!

We also carry: Mark Data, Tom Mix, Frank Hogg, Botek, Kraft, WICO, Star Kits, Dugger's Growing System, Amdek, Signalman, C. Itoh, CompuServe, Comrex, Taxan, Gorilla, Elite Software, Arcade Animation & More! Books Galore!

NEW LOWER PRICES



## DISK SYSTEMS

**Half-size drives at no additional charge!**

Our disk system uses top quality drives | plus cable, controller, & manual!

| | |
|---|---|
| single drive, single-sided | $425.00 |
| single drive, double-sided | $475.00 |
| dual drives, single-sided | $650.00 |
| dual drives, double-sided | $750.00 |
| Amdisk — new 3½" dual drives | |
| drives only | $499.00 |
| complete system | $650.00 |

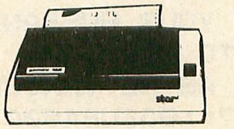
**PLUS $25 Computerware software credit with purchase** (may be used at time of purchase)

## J+M SYSTEMS CONTROLLER BOARD

for more reliability & gold connectors!

| | |
|---|---|
| with JDOS<br>supports double-sided drives and 40 tracks | $135.00 |
| with RSDOS | $155.00 |

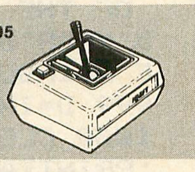
## PRINTERS



| | |
|---|---|
| C. Itoh 8510<br>w/interface $459.99 | $399.99 |
| Letter Quality Juki Printer<br>w/interface $549.00 | $489.00 |
| Botek Interface<br>(parallel to serial interface) | $64.95 |

## KRAFT JOYSTICK NOW $29.95

high performance with linear pots & switch selection between self-centering or free-floating



**WICO joystick adapter** $18.95

(interface Atari type joysticks to the Color Computer)

**BUMPER STICKERS!!**

$1.00 each

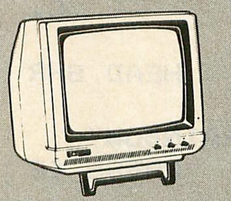
PROGRAMMERS DO IT A BYTE AT A TIME

COMPUTERWARE · Box 668 Encinitas CA 92024 (619) 436-3512

$ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $ $

## ATTRACTIVE AUTHORSHIP PROGRAM

for independent programmers who want to turn software into cash! Call or write for details.



with AUDIO

## MONITORS

Our monochrome monitors have *audio* — no need to add expensive amplifiers or go without sound! Our NAP monitors are the same as the familiar *Gorilla* — except that by special arrangement with North American Phillips (Magnavox) ours has the *audio amplifier built in!*

| | |
|---|---|
| NAP green screen | $109.95 |
| NAP amber screen | $119.95 |
| Color with audio | $295.00 |

SPECIAL OFFER

**Buy your monitor from Computerware and you get your Video Plus for $5 LESS !!**

(Monitor and Video Plus must be purchased together)

## VIDEO PLUS $24.95

interface for original CoCo and either a monochrome or color composite video monitor

## VIDEO PLUS II M $26.95

NEW

interface for CoCo II and a monochrome composite video monitor

## VIDEO PLUS II C $39.95

NEW

interface for CoCo II and a color composite video monitor

## VIDEO CLEAR for TV output $14.95

(eliminates RF interference)

VISA

Mail to: COMPUTERWARE®
P.O. Box 668 • Dept. E02
Encinitas, CA 92024 • (619) 436-3512

| DESCRIPTION | QUANT. | PRICE | TOTAL |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | *SHIP & TAX | |
| | | TOTAL | |

VISA ☐ MASTERCARD ☐ CHECK ☐

CARD # ________ EXP. ________

NAME ________

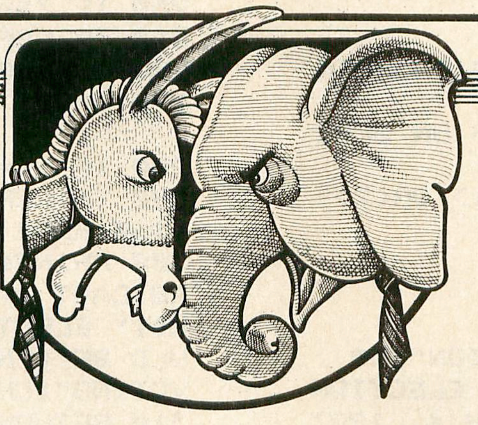
ADDRESS ________

CITY ________ STATE ________ ZIP ________

SIGNATURE ________

*Shipping: Under $100 — add $2 surface, $5 air/Canada
Over $100 — add 2% surface, 5% air/Canada
Calif. residents add 6% sales tax.

```
140 CLS:FOR I=1 TO 3:PRINT:NEXT:
PRINT"TO THE LADY OF THE HOUSE:"
141 PRINT:PRINT"  GIVE THIS TEST
 YOUR BEST SHOT.  SEE YOUR SUSPI
CIONS CONFIRMED OR REST ASSURED
THAT ALL IS    STILL UNDER CONT
ROL."
142 PRINT:PRINT"               C.
C. COCONUT,
143 PRINT"            HEAD SHR
INK,
144 PRINTTAB(14)"THE RAINBOW"
145 PRINT:INPUT"         PRESS <E
NTER>";A$
190 REM
200 CLS:FOR I=1 TO 6:PRINT:NEXT
210 PRINT"  ANSWER ALL QUESTIONS
 WITH A   'YES' OR 'NO' ONLY!"
211 PRINT:INPUT"         PRESS <E
NTER>";A$
300 CLS:PRINT:PRINT"1.  DOES YOU
R HUSBAND SUBSCRIBE TO 'THE RAIN
BOW' AND OTHER COM- PUTER MAGAZI
NES?":GOSUB4000
310 PRINT:PRINT"2.  DOES YOUR HU
SBAND FAIL TO   NOTICE WHEN YOU
SLIP HIM A COLD T.V. DINNER FOR
SUPPER?":GOSUB4000
320 PRINT:PRINT"3.  DOES HE DISA
PPEAR INTO HIS  COMPUTER 'NEST'
RIGHT AFTER SUP-PER":GOSUB4000
330 CLS:PRINT:PRINT"4.  DOES YOU
R HUSBAND FORGO THE WORLD SERIES
 OR THE SUPER BOWL  TO TIPPY-TOE
 INTO HIS 'NEST'?":GOSUB4000
340 PRINT:PRINT"5.  DO YOU FIND
YOURSELF WATCH- ING T.V. BY YOUR
SELF?":GOSUB4000
345 PRINT:PRINT"6.  DO YOU HAVE
A TENDENCY TO   SCREAM WHEN YOUR
 HUSBAND GETS   INTO A MONOLOGUE
 ABOUT THE 256K CHIP?":GOSUB4000
350 CLS:PRINT:PRINT:PRINT"7.  DO
ES HE SPEAK IN A STRANGE  LANGUA
GE, 'JARGONESE'?":GOSUB4000
360 PRINT:PRINT"8.  DOES HE HAVE
 A TENDENCY TO  TALK TO HIS COCO
?":GOSUB4000
370 PRINT:PRINT"9.  DO YOUR CHIL
DREN ASK, 'HAS  DADDY GONE TO HE
AVEN?', BECAUSE THEY NEVER SEE H
IM ANYMORE?":GOSUB4000
380 CLS:PRINT:PRINT:PRINT:PRINT"
10.  DO YOU CATCH YOURSELF
CHECKING OUT THE OBITUARY COLUMN
JUST IN CASE THEY MAY BE RIGHT?"
:GOSUB4000
390 PRINT:PRINT"11.  DOES YOUR H
USBAND READ LONGCOMPUTER LISTING
S INSTEAD OF THESTOCK MARKET QUO
TES AT THE DIN- NER TABLE?":GOSU
B4000
400 CLS:PRINT:PRINT:PRINT:PRINT"
12.  DOES HIS INCOMING MAIL CON-
SIST PRIMARILY OF 'THE RAINBOW',
OTHER COMPUTER MAGAZINES AND A
MESS OF COMPUTER-ORIENTED THIRD
CLASS MAIL?":GOSUB4000
410 PRINT:PRINT"13.  WHEN YOU DR
AG HIM TO THE   LOCAL SHOPPING M
ALL, DOES HE    HAUNT THE RADIO
SHACK OUTLET?":GOSUB4000
420 CLS:PRINT:PRINT:PRINT"14.  A
RE COBWEBS GROWING ON HIS TOOLS
IN HIS WORKROOM?":GOSUB4000
430 PRINT:PRINT"15.  DO YOU THIN
K HE'LL NEVER   PAINT THE HOUSE
AGAIN?":GOSUB4000
440 PRINT:PRINT"16.  DOES HE MUM
BLE SOMETHING   ABOUT WISHING HE
 HAD THE MONEY  TO UP-GRADE?":GO
SUB4000
450 CLS:PRINT:PRINT:PRINT:PRINT"
17.  DOES HE BUG YOU FOR YOUR
SECRET CACHE OF MAD MONEY SO HE
CAN BUY MORE SOFTWARE?":GOSUB400
0
460 PRINT:PRINT"18.  HAVE YOU NO
TICED THAT ON   BLUE MONDAYS, WH
EN YOUR HUSBAND IS TOO SICK TO G
O TO WORK, HE   SMILES CONTENTED
LY AS HE VANISH-ES INTO HIS 'NES
T'?":GOSUB4000
470 CLS:PRINT:PRINT:PRINT:PRINT"
19.  IN HIS INTIMATE CONVERSA-
TIONS WITH YOU, DOES THE SUBJECT
MYSTERIOUSLY TURN TO HIS LATEST
COMPUTER PROJECT?":GOSUB4000
480 PRINT:PRINT"20.  IS HIS IDEA
 OF THE IDEAL   BIRTHDAY GIFT A
3 YEAR'S SUB-   SCRIPTION TO 'TH
E RAINBOW'?":GOSUB4000
999 D=INT(C/2)
1000 CLS:FOR I=1 TO 4:PRINT:NEXT
:PRINTTAB(10)"THE BAD NEWS"
1010 PRINT:PRINT:PRINT"  ON A SC
ALE FROM 1 TO 10, YOU  ARE";D;"O
N YOUR WAY TO BECOMING A COMPUTE
R WIDOW!"
2000 GOTO 2000
4000 '
4001 INPUTB$:IF B$="YES" THEN C=
C+1
4002 RETURN
```



# Nothing Can Hold A (Roman) Candle To This Tallying Method

### By Howard Lee Ball

Except for the blaze in the fireworks truck at the annual Fourth of July picnic, it is pretty unexciting around the newsroom of a small-town newspaper. When there is an election, there is a special excitement which almost rivals watching all those Roman candles chase the mayor around the school field.

The networks have their big old mainframe computers to help them in an election, but my small twice-weekly newspaper has CoCo.

We use the TRS-80 Color Computer around here as a management tool. My department budget is prepared using my CoCo. I prepare a disk which the publisher cranks up on his CoCo when we sit down to talk turkey.

Elections used to cause a madhouse mainly because there are certain elements this old editor wanted covered which took some time to figure.

I like to have the total registration, the total vote and other percentages in my report of an election. It gives the people a better view of the contest.

The problem was getting all the statistics together in the short time between the time the polls close and press-time. It took quite a few calculators and not a few frayed nerves to put it all together.

Last election was a breeze. I wrote this short program which just fit the bill. Even if you don't have a newspaper, you can tabulate a town election for fun, or use it for your club or school vote.

You may want to modify it to accept ward or district sub-totals. I was not so inclined but understand why someone might want that information.

It works on either screen or printer and will ask which you want. The printer commands are for the DMP-100, but you can fit it to your needs.

The program asks you what kind of election. You can input the word school or general or mayoral. It will ask for the date, the town, the total registered vote and the total vote. Then it will go into the candidate section asking the number of candidates for the post and the name of the post. When you have it all input, the results will be printed or will pop up on the screen. You must enter a party (DEM, GOP, or NONE).When we used it under pressure, we found the hard copy to be the very best way. I took the numerical results from a tabulation sheet, input that into the CoCo and handed the reporter his figures seconds later. It was a real help.

Of course, my candidate lost the election, but that won't happen after I write that program to project the next winner in the hog-calling contest.

*(Howard Lee Ball is the editor of a bi-weekly newspaper and uses his CoCo in business. He is a licensed minister, and is a regular contributor to* RAINBOW *reviews.)*

| | |
|---|---|
| 160 ....... | 225 |
| 350 ....... | 49 |
| END ...... | 209 |

**The listing:**

```
5 CLS
10 PRINT@ 71,"ELECTION TABULATIO
M"
20 PRINT@ 134,"***FOR ANY CONTES
T***"
30 PRINT @ 232,"BY HOWARD L. BAL
L"
40 PRINT@ 357,"COPYRIGHT<C>MARCH
 1983"
50 FOR T=1 TO 1600
60 NEXT T
70 X=0
80 CLS
```

```
90 DEF FNA(Y)=INT(100*Y+0.5)/100
99 'MENU
100 PRINT @ 78,"MENU"
101 PRINT@ 166, "RESULTS ON PRIN
TER<1>"
102 PRINT@ 230, "RESULTS ON SCRE
EN <2>"
103 PRINT @ 392,"INPUT<1> OR<2>"
105 INPUT PS
110 IF PS=1 THEN P=-2
111 IF PS=2 THEN P=0
130 'TOWN INPUT ROUTINE
140 INPUT"KIND OF ELECTION";K$
150 LINE INPUT" DATE OF ELECTION
                EGS.<NOV 4, 1983
>";D$
160 INPUT"NAME OF TOWN";T$
170 GOSUB 320
180 PRINT"TOTAL REGISTERED VOTER
S          IN ";T$
190 INPUT TR
200 INPUT"TOTAL VOTING IN THIS E
LECTION WAS";TV
210 IF TV>TR THEN SOUND 200,8:PR
INT "ERROR=TOTAL VOTE CANNOT EXC
EED  REGISTRATION":GOTO200
220 GOSUB 300
230 GOSUB 360
240 INPUT "DO YOU WANT ANOTHER R
ACE, SAME TOWN";Z$
250 IF Z$="" THEN 240
260 IF LEFT$(Z$,1)="Y" THEN GOTO
380ELSE GOTO 270
270 INPUT "DO YOU WANT TO DO
          ANOTHER TOWN";Z$
280 IF Z$="" THEN GOTO 270
290 IF LEFT$(Z$,1)="Y" THEN GOTO
 160 ELSE END
300 PRINT#P, TV;" OF ";TR;" VOTE
RS CAST BALLOTS IN THE ";D$;" ";
K$;" ELECTION IN ";T$".  THAT WO
ULD BE";FNA(TV/TR*100);"PERCENT
VOTING";CHR$(13)
310 RETURN
320 F$=RIGHT$(D$,4)
330 PRINT#P,CHR$(15);CHR$(31);"R
ESULTS FOR ";F$;"  ";K$;" ELECTI
ON"
340 PRINT#P,"IN ";T$;CHR$(14);CH
R$(14);CHR$(13);CHR$(30)
350 RETURN
360 INPUT "POSITION SOUGHT";J$
370 GOSUB 530
380 INPUT"HOW MANY CANDIDATES";M
390 FOR X=1 TO M
400 PRINT"YOU WILL BE ASKED TO I
NPUT      CANDIDATE AND PARTY IN
 THE      FOLLOWING FASHION
          <CANDIDATE-XXX> WHERE
XXX=PARTY IF ELECTION IS NON PAR
TISAN     THEN PARTY IS<-NONE>
410 PRINT "CANDIDATE -";X
420  INPUT C$(X)
430 P$=RIGHT$(C$(X),4)
450 IF P$="-DEM"OR P$="-GOP" OR
P$="-REP" OR P$="NONE" THEN GOTO
 470 ELSE GOTO 460
460 SOUND 200,10:PRINT"INVALID P
ARTY ENTRY":GOTO 400
470 INPUT"VOTES";V(X)
480 IF X=M THEN GOSUB  550
490 NEXT X
500 GOTO 240
510 REM
520 FOR X=1 TO M
530 PRINT#P,CHR$(31);"VOTING FOR
 ";J$;"  WAS AS FOLLOWS:";CHR$(3
0)
540 RETURN
550 FOR X=1 TOM
560 PRINT #P, C$(X);"  POLLED";V
(X);" IN ";T$;" OR ";FNA(V(X)/TV
*100);" PERCENT OF THE TOTAL VOT
E";CHR$(13)
570 NEXT X
580 SOUND 180,10
590 RETURN
600 END
```

YOUR TRS-80* SPECIALISTS
IN CANADA

CMD MICRO COMPUTER SERVICES LIMITED
HACKER'S PARADISE
EDMONTON

SOFTWARE FROM
ADVENTURE INTERNATIONAL
COMPUTERWARE
TOM MIX
MED SYSTEMS
SPECTRAL
PRICKLEY PEAR
PROGRAMMERS GUILD
COGNITEC
PRISM
DATASOFT
AND MORE

DISK DRIVES
EPSON PRINTERS
MARK DATA KEYBOARD KITS
WICO & KRAFT JOYSTICKS
BOOKS & MAGAZINES

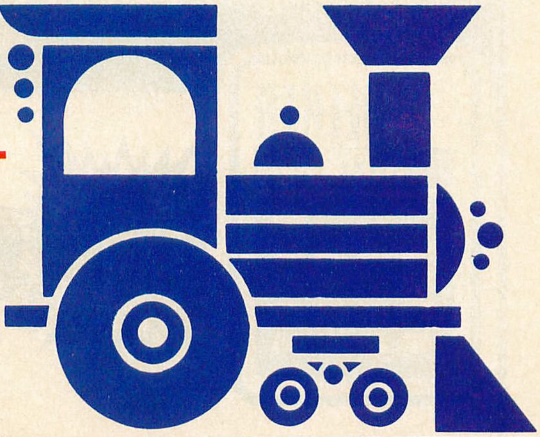
VISA & MASTER CARD
ACCEPTED

WRITE OR PHONE FOR A FREE CATALOGUE

CMD MICRO
COMPUTER SERVICES LTD.

10447 - 124 STREET
EDMONTON, ALBERTA
T5N 1R7
PHONE 403 - 488-7109

*TRS-80 IS A TRADEMARK OF TANDY CORP.



# LoCo CoCo And The 1812

### By Sheila Elliot

Having a pre-schooler who refused to go to nursery school because "they don't play chess right there," is not the easiest thing to deal with. One of our ways of handling the situation is enlisting our CoCo to help provide stimulating and educational entertainments in our home.

Since Gilbert adores his father's model trains, our first effort was a sing-along, read-along rendition of "I've Been Working on the Railroad," complete with simple train that builds up as we sing along. The text scrolls, so that by the end, the entire song and train are visible on the screen. There is nothing to do in this program but load it, *RUN*, and sing along. It automatically repeats, so when you are tired of "working," hit the BREAK key.

By changing the color numbers in the variables X (lines 2059 and 2100, locomotive), Y (line 2305, box car) and Z (line 2414, caboose), you can create different colored trains.

(A special note — we do realize that "IVE" is misspelled, and should have been "I'VE." The reason we dropped the apostrophe was to fit everything on the screen. The apostrophe forced a second line for two passages, thus scrolling the train off much too early.)

The second program, *MUS1812*, is actually our attempt at "orchestrating" Tchaikovsky's "1812 Overture" on the CoCo. By using the model "piano player" program found in Radio Shack's *Getting Started With Color BASIC* manual on Page 294, we were able to convert a portion of the keyboard into a "piano." Then the fun began — Gilbert, John and I spent a hilarious evening listening and trying to hum back, the key passages of the overture. Once we got the hang of it, picking out the right keyboard letters and translating them to simple *SOUND* statements was easier than would be suspected. Believe me, the CoCo is a much better "Simon" player than the original could ever have been!

What was especially gratifying was the realization that game playing was teaching careful listening and memory skills, without drudgery and boredom.

We chose a symbolic firework as the visual accompaniment in tribute to the Boston Symphony's immensely popular Labor Day program of "1812" and fireworks, the annual ending of each concert series on the Tanglewood lawns in Stockbridge, Mass.

Again, simply load this program, type *RUN*, and enjoy. It's amazing what you and your CoCo can do!

*(Sheila Elliot, a system project leader for Commercial Computer Systems at T.J. Lipton, Inc., does freelance writing and editing. She lives in Upper Nyack, N.Y. with her husband, John, and Gilbert, her four-year-old son.)*

305......201
END.....255

**Listing 1:**

```
5 REM 1812 OVERTURE ADAPTATION B
Y SHEILA ELLIOT 1984
6 CLS(1)
10 CLS:PCLS:PMODE 4,1:SCREEN 1,1
100 GOSUB 1000
101 FOR I=2 TO 10 STEP 2
```

# CoCo HEADQUARTERS

## Looking to unlock the capacity of your Color Computer?
## Search no more......

**DELKER**
**ELECTRONICS**

NOW!
TOLL FREE
TENNESSEE
800-545-2502

FEATURING. . . .

Discounted Hardware
Accessories for your every need
Quality software by MSI

### HARDWARE SPECIALS

| | |
|---|---|
| Extended Basic w/bk | $ 39.95 |
| 64k (DEI) Memory Upg | $ 59.95 |
| Amdek Disk Drives | $ 499.95 |
| 26-3029 CoCo Drive 0 | $ 349.95 |
| 26-3023 CoCo Drive 1 | $ 239.95 |
| HJL Keyboard (D,E,F) | $ 79.95 |
| Super Pro Keybd. (D,E) | $ 64.95 |

| | |
|---|---|
| 26-3026e 16k Extended CoCo2 | $ 189.95 |
| 26-3026e64 64k Extended CoCo 2 | $ 249.95 |
| 26-1261 TP-10 Thermal Printer | $ 89.95 |
| 26-1192 CGP-115 Printer/Plotter | $ 179.95 |
| C. Itoh Banana Serial 50 cps | $ 249.95 |
| 26-3024 RS Multi-Pac Interface | $ 149.95 |
| Botek Ser/Par Interface | $ 69.95 |

### ACCESSORIES

| | |
|---|---|
| RS D.C. Modem IB | $ 89.95 |
| Novation J-Cat Modem | $ 129.95 |
| RS D.C. Modem II | $ 179.95 |
| Hayes SM 300 Modem | $ 239.95 |
| CoCo Switcher | $ 39.95 |
| Elephant Disks ssdd | $ 22.95 |

| | | |
|---|---|---|
| 26-3030 OS-9 (64k) | $ 64.95 | (disk) |
| Basic-09 (req. OS-9) | $ 87.95 | (disk) |
| FHL O-Pak (req. OS-9) | $ 34.95 | (disk) |
| Elite Word | $ 59.95 | (d&c) |
| Elite Calc | $ 59.95 | (d&c) |
| Color Term Plus | $ 29.95 | (cass) |

### MSI SOFTWARE (Dealer inquiries invited)

"Software that works when you've finished playing games."

| MSI DISKUTIL | COLOR FINANCE I | COLOR FINANCE II | MSI NAMEFILE | MSI CALENDAR |
|---|---|---|---|---|
| Display or change data in any record. Maintain extra copy of disk directory for easy error recovery plus more.<br>A must for every disk owner. | Let your CoCo manage your financial records. Handles multiple checking accounts, loans, expenses, budgets, etc. Print monthly and year to date reports. More... | Same as COLOR FINANCE I plus checkwriter, auto reconciliation and MSI CALENDAR. Perfect for Home or Business. | Maintain over 600 name and addresses with direct access to each name. Up to 15 user defined fields. Print name list or labels. | Print or display any month for years 1900-1999. Maintain special dates, appointments, recurring payments and more... |
| NEW $ 19.95 | RAINBOW $ 49.95 | NEW $ 69.95 | RAINBOW $ 24.95 | NEW $ 19.95 |

All MSI Software Requires 32k Disk/Extended Basic (Printer Recommended for Finance Programs)

**TOLL FREE TENNESSEE 1-800-545-2502**

*************************************************************************

Call for prices and availability of your other favorite software
All advertised items subject to availability
Prices do not include shipping & handling

**TOLL FREE 1-800-251-5008**

All of the above units covered by our 120 day carry in warranty.

TRS-80 Trademark Tandy Corporation.
Prices subject to change without notice.

Write for our FREE newsletter!

FACTORY DIRECT
PURE RADIO SHACK EQUIPMENT
"THE COCO PROFESSIONALS"

VISA MasterCard AMERICAN EXPRESS

DELKER ELECTRONICS, INC.
P.O. BOX 897 DEPT D
SMYRNA, TN 37167
800-251-5008
800-545-2502 (TENNESSEE)
615-459-2636 (TENNESSEE)
615-254-0088 (NASHVILLE)

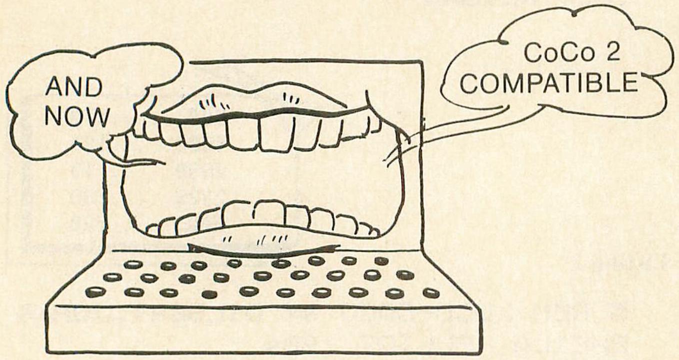
```
102 CIRCLE(128,96),I:NEXT I
110 GOSUB 1000
112 FOR I=12 TO 20 STEP 2
114 CIRCLE(128,96),I:NEXT I
200 SOUND 125,3
202 SOUND 159,3
204 SOUND 170,3
205 SOUND 176,3
206 SOUND 170,3
207 SOUND 159,3
208 SOUND 170,3
209 SOUND 176,3
210 SOUND 170,3
212 SOUND 159,3
214 SOUND 170,3
216 SOUND 176,3
220 FOR I = 22 TO 30 STEP 2
224 CIRCLE(128,96),I:NEXT I
300 REM 4TH PASSAGE
302 SOUND 108,3
303 SOUND 147,3
304 SOUND 159,3
305 SOUND 170,3
306 SOUND 159,3
307 SOUND 147,3
308 SOUND 159,3
309 SOUND 170,3
310 SOUND 159,3
312 SOUND 147,3
314 SOUND 159,3
316 SOUND 147,6
320 FOR I=32 TO 40 STEP 2
322 CIRCLE(128,96),I:NEXT I
400 REM LONG NOTES PASSAGE
402 SOUND 108,10
403 SOUND 125,8
404 SOUND 125,8
405 SOUND 108,10
406 SOUND 78,5
407 SOUND 32,15
408 FOR I = 42 TO 50 STEP 2
410 CIRCLE (128,96),I:NEXT I
450 SOUND 147,10
451 SOUND 140,7
452 SOUND 125,7
453 SOUND 108,10
454 SOUND 125,7
455 SOUND 78,15
460 FOR I = 52 TO 60 STEP 2
462 CIRCLE(128,96),I:NEXT I
999 GOTO 6
1000 REM MAIN THEME
1002 SOUND 108,3
1004 SOUND 147,3
1006 SOUND 159,3
1008 SOUND 170,3
1009 SOUND 159,3
1010 SOUND 147,3
1011 SOUND 159,3
1012 SOUND 170,4
1013 SOUND 147,4
1014 SOUND 147,5
1020 RETURN
```

```
500......179
1009.....124
2099......18
2325.....189
END.....228
```

Listing 2:

```
5 REM LOCO-COCO BY GILBERT,JOHN&
SHEILA  ELLIOT 1984
20 CLS
50 Y=27:Z=28
90 GOSUB 2000
99 REM I'VE BEEN WORKING ON THE
RR
100 GOSUB 999
195 GOSUB 2050
198 PRINT @448,"ALL THE LIVE-LON
G DAY"
200 SOUND 176,5: SOUND 176,3
202 SOUND 147,5:SOUND 159,5:SOUN
D 170,15
295 GOSUB 2100
299 REM IVE BEEN WORKING ON THE
RR
300 GOSUB 999
398 PRINT @448,"JUST TO CHASE MY
 CARES AWAY"
399 GOSUB 2200
400 SOUND 170,5:SOUND 170,3:SOUN
D 170,5
403 SOUND 159,5:SOUND 159,5:SOUN
D 170,5
406 SOUND 159,15
497 REM DON'T YOU HEAR THAT WHIS
TLE
498 GOSUB 1030: GOSUB 2300
500 SOUND 159,7:SOUND 159,3:SOUN
D 153,3
503 SOUND 159,3:SOUND 170,3:SOUN
D 159,3
506 SOUND 147,8:SOUND 108,10
598 PRINT @ 480,"DINAH DON'T YOU
 HEAR THAT HORN?"
600 SOUND 176,5:SOUND 176,3:SOUN
D 176,3
603 SOUND 176,3:SOUND 147,5:SOUN
D 159,5
606 SOUND 170,10
698 GOSUB 1030: GOSUB 2400
700 SOUND 125,5:SOUND 140,3:SOUN
D 147,3
703 SOUND 140,3:SOUND 147,3:SOUN
D 125,3
706 SOUND 108,9:SOUND 147,10
798 PRINT @480,"DINAH, HERE I'M
```

# *Nobody Does It Better In Speech or Music*



## THE VOICE

You get CoCo's best hardware speech synthesizer using the VOTRAX SC-01, THE VOICE (was $119.95).

Included is a text to speech ML program FREE to allow any BASIC program to speak in minutes (was $29.95).

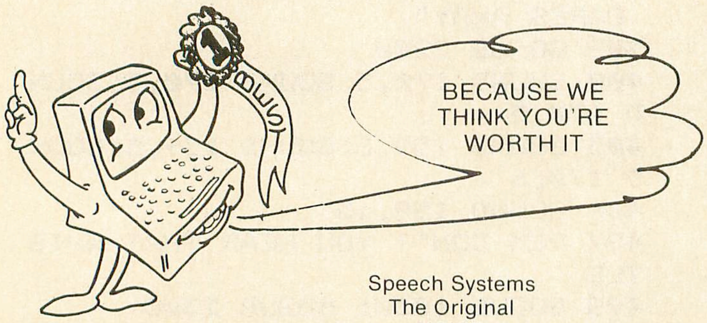
You also get 6 education and fun programs FREE (a $34.95 value).

You will have access to an ever growing library of software.

Disk owners don't despair, THE VOICE works in all multi-pac units including our own Y-CABLE.

You can find speech units for less and a lot for more, but you won't find any better.

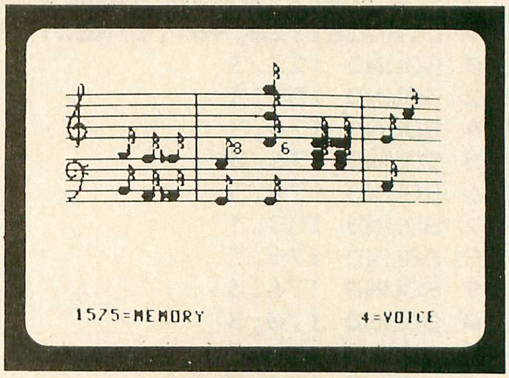
All hardware and software (tape or disk) **$79.95**


1
BECAUSE WE THINK YOU'RE WORTH IT

| | Speech Systems The Original VOICE |
|---|---|
| Speech thru TV speaker | Yes |
| Speech thru external speaker | Yes |
| Volume control | Yes |
| Pitch control adjustment | Outside |
| Demo Programs | 5 |
| Phoneme Editor | Yes |
| Text-to-Speech program | Yes |
| Documentation | 30 pages |
| Software | 2 tapes |
| IC count | 6 |
| Case material | Aluminum |
| Case size | 15/16 x 5½ x 4¼ |
| CoCo 2 version | Yes |
| Expansion Unit Compatibility | |
| RS Multi-pak | Yes |
| BT-1000 | Yes |
| Spectrum Switcher | Yes |
| Y-Pak | Yes |
| Y-Cable | Yes |

NOTE: All software (except Termtalk) will work on either unit, so you can buy our software and their hardware or vice versa.

see us at RAINBOWfest CHICAGO



(Actual Photo)

## MUSICA

4 Notes produced simultaneously.
Input notes from keyboard or joystick.
Develop your own unique sounding instruments.
Vary tempo as music plays.
Save or load music from tape or disk.
Call music from your own BASIC program.
Music produced in stereo when used with the STEREO COMPOSER.
All features are fast because it's all machine language.
It doesn't get any better than this.

Tape **$34.95** (16K) (32K) Disk **$39.95**

## MUSIC LIBRARY

Play these 4 part music selections without any additional software, or use as source for Musica. Over 100 tunes. Comes on tape, may be copied to disk. Ten or more tunes on each tape.

32K Ext Each **$9.95**

- Music from Stage, Screen and Television
- Pop Songs of the 70's
- Pop Songs of the 60's
- Pop Songs of the 50's
- Old Time Favorites
- Classical
- Christmas Music (Sacred)
- Christmas Music (Popular)
- Patriotic

## STEREO COMPOSER

CoCo's one and only stereo music synthesizer. Plug it into the cartridge slot, connect to external speakers or your home stereo and you're ready for music realism. Comes with the COMPOSER 4 voice software. Separate left and right channel volume controls. Two 8 bit D to A's — for perfect reproduction. May be used with our best software "MUSICA." Disk owners may use any expansion unit or our Y-CABLE.

Tape or Disk **$69.95**

Dealer Inquiries Invited

If your dealer doesn't stock our products, ask for them.

We accept CASH, CHECK, COD, VISA, and MASTER CARD orders.

| | |
|---|---|
| Shipping and handling US and Canada | $2.00 |
| Shipping and handling outside the US and Canada | $5.00 |
| COD charge | $2.00 |

Illinois residents add 6¼% sales tax for the STEREO COMPOSER or THE VOICE.

## *Speech Systems*

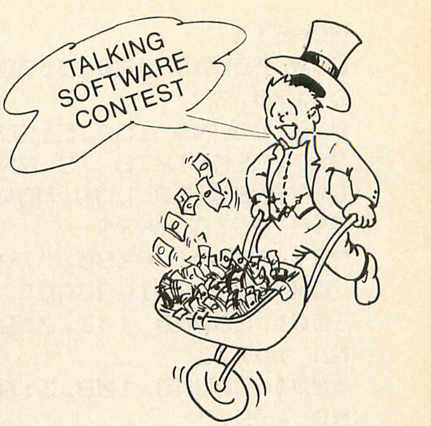
**38W255 DEERPATH ROAD**
**BATAVIA, ILLINOIS 60510**
**(312) 879-6880 (24 HR. VOICE)**
**(312) 879-6811 (24 HR. BBS)**

CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.
WE SHIP FROM STOCK WITHIN 48 HOURS.

$100 awarded for the best talking program for education, the handicapped, home security or other serious application.

Another $100 for the best entertainment talking program.

Contest winners and other program authors will be offered a contract with generous royalties. Contest ends 5/31/84.

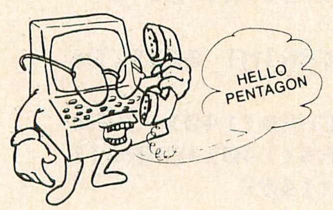


### SPECIAL INVITATION

To our friends who purchased the Spectrum Projects Voice-Pak, please be advised that your programs will work with our speech synthesizer and we will gladly accept your contest entry.

*All Programs for the original Speech Systems Voice or Spectrum Projects Voice-Pak**

## TERMTALK
### (Smart)



The first smart talking terminal program. All the features of an intelligent telecommunications program plus what appears on the TV is spoken just like in the movie WAR GAMES.

### Features

- Upload and Download programs
- Full or Split Screen
- Normal or Reverse Video
- Control Xmit Protocols
- Buffer Editing
- When used with VOICE it talks (The Voice is only necessary if you want talking capability).

Tape **$39.95** Disk **$49.95**

Speech Systems believes Termtalk can be of particular use to those with a sighting impairment. We are currently trying to develop a nationwide network to allow such handicapped persons to telecommunicate. Anyone purchasing Termtalk for this application will receive a $5.00 discount.

## COLOR MATH

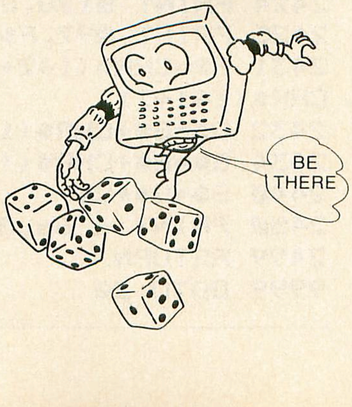
The perfect educational game to aid the student in learning addition, subtraction, multiplication and division. Allows one to specify difficulty level.
Tape (32K Ext) **$28.95**

## SPELL-A-TRON

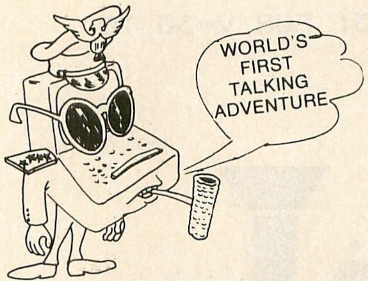
The program allows the user to build a dictionary of words. During testing, the words are spoken. If an incorrect response is given, the word is spoken again and spelled.
Tape (32K Ext) **$28.95**

## SCORE E-Z

A yahtzee type program. Up to six players can compete. All scoring and record-keeping is done by the computer.
Tape (32K Ext) **$24.95**



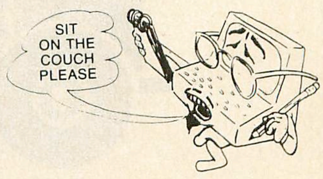
*Termtalk requires the Speech Systems Voice



## FINAL COUNTDOWN

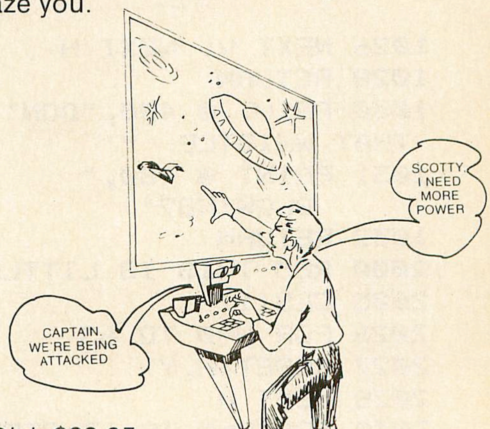
You must stop the mad general from launching a missile at Moscow and causing WW III. Has multiple voices for added realism.
Tape (32K Ext) **$24.95**

## ESTHER


SIT ON THE COUCH PLEASE

Meet Esther the talking psychoanalyst. An excellent example of artificial intelligence. She may not solve all your problems, but her insight will amaze you.
(32K) Tape **$24.95**
Disk **$28.95**

## STAR TALK



You're the Star Fleet Captain. Your mission . . . destroy the enemies' Dragon Star Ships. All status reports are spoken!
(32K) Tape **$24.95** Disk **$28.95**

### More Talking Software

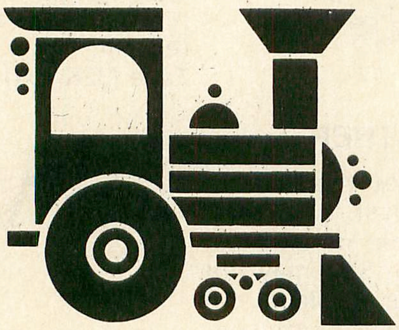
| | | |
|---|---|---|
| **PRESIDENTS** | (32K Ext Know your U.S. Presidents) | $9.95 |
| **CAPITALS** | (32K Ext What's the capital of New Hampshire) | $9.95 |
| **STATES** | (32K Ext Makes learning the states fun) | $9.95 |
| **HANGMAN** | (32K Ext Guess the word before you hang) | $9.95 |
| **MATH DRILL** | (16K Ext Arithmetic was never so much fun) | $9.95 |
| **SPELLING TESTER** | (16K Ext Win your next spelling bee) | $9.95 |
| **FOREIGN LANGUAGES** | (16K Ext Learn a foreign language) | $9.95 |
| **POETRY CREATOR** | (16K Ext Robert Frost was never like this) | $9.95 |
| **SHORT STORY MAKER** | (16K Ext You've got to hear this one) | $9.95 |

And much more to come. Don't forget the contest.

## THE Y-CABLE

Disk owners why pay $100 to $300 for a multi-pac unit. With our Y-CABLE you can connect your disk in one connector and the VOICE or STEREO COMPOSER in the other. All gold connectors. **$29.95**

```
HOME!"
800 SOUND 170,5:SOUND 176,5:SOUN
D 170,5
803 SOUND 159,5:SOUND 147,10
997 REM THIS IS END OF PGM. SUBR
OUTINES FOLLOW NOW.
998 GOTO 9999
999 PRINT @480,"IVE BEEN WORKING
 ON THE RAILROAD"
1001 SOUND 147,7:SOUND 108,3:SOU
ND 147,3
1004 SOUND 108,3:SOUND 147,3:SOU
ND 159,3
1007 SOUND 170,9:SOUND 147,7
1009 RETURN
1020 FOR H=0 TO 63: FOR V=30 TO
31
1024 SET (H,V,0)
```



```
1026 NEXT V: NEXT H
1028 RETURN
1030 PRINT @ 480,"DON'T YOU HEAR
 THAT WHISTLE  "
1031 PRINT @ 480,"
     BLOWING?"
1032 RETURN
2000 REM THIS IS LITTLE TRAIN
2005 CLS(1)
2026 FOR H=0 TO 63
2027 RESET(H,Y)
2028 NEXT H
2030 FOR H=0 TO 63 STEP 2
2035 FOR H=0 TO 63 STEP 2
2040 RESET(H,Z)
2045 NEXT H
2048 RETURN
2050 A$=CHR$(128)+CHR$(128)+CHR$
(140)+CHR$(140)
2052 A$=A$+CHR$(132)+CHR$(132)+C
HR$(132)
2054 A$=A$+CHR$(140)+CHR$(140)
2059 X=143+48
2060 B$=CHR$(X)+CHR$(X)+CHR$(X)+
CHR$(X)+CHR$(X)+CHR$(X)+CHR$(X)
2090 PRINT @374,A$
2092 PRINT @342,B$
2099 RETURN
2100 X=48
2102 C$=CHR$(142+X)+CHR$(141+X)+
CHR$(143+X)+CHR$(143)+CHR$(128)
2103 C$=C$+CHR$(143)+CHR$(141)
2105 PRINT @310,C$
2110 D$=CHR$(139)+CHR$(128)+CHR$
(135)
2115 PRINT @281,D$
2120 RETURN
2200 E$ = CHR$(136)+CHR$(140)+CH
R$(140)+CHR$(140)+CHR$(140)+CHR$
(132)+CHR$(140)
2205 F$=CHR$(140)+CHR$(140)+CHR$
(140)+CHR$(140)+CHR$(140)+CHR$(1
40)+CHR$(143)
2210 G$=CHR$(143)+CHR$(143)+CHR$
(143)+CHR$(143)+CHR$(143)+CHR$(1
43)+CHR$(143)
2215 E$=E$+A$:F$=F$+B$:G$=G$+C$
2230 PRINT @303,E$
2235 PRINT @271,F$:PRINT @239,G$
2299 RETURN
2300 A$=CHR$(136)+CHR$(140)+CHR$
(140)+CHR$(140)+CHR$(140)+CHR$(1
40)+CHR$(132)+CHR$(140)
2305 Y=80
2310 B$=CHR$(143+Y)+CHR$(143+Y)+
CHR$(143+Y)+CHR$(143+Y)+CHR$(143
+Y)+CHR$(143+Y)+CHR$(143+Y)+CHR$
(143)
2315 C$=CHR$(143)+CHR$(143)+CHR$
(143)+CHR$(143)+CHR$(143)
2320 C$=C$+CHR$(143)+CHR$(143)+C
HR$(143)
2325 A$=A$+E$:B$=B$+F$:C$=C$+G$
2330 PRINT @ 231,A$:PRINT @199,B
$
2335 PRINT @ 167,C$
2399 RETURN
2400 E$=CHR$(143)+CHR$(136)+CHR$
(140)
2405 E$=E$+CHR$(140)
2410 E$=E$+CHR$(140)+CHR$(132)+C
HR$(140)
2411 E$=E$+A$
2414 Z=96
2415 F$=CHR$(143+Z)+CHR$(143+Z)+
CHR$(143+Z)+CHR$(143+Z)+CHR$(143
+Z)+CHR$(143)
2420 F$=F$+B$
2424 PRINT @128,E$
2425 PRINT @97,F$
2431 G$=CHR$(142+Z)+CHR$(143+Z)+
CHR$(141+Z)
2432 G$=G$+CHR$(143)
2434 G$=G$+CHR$(143)
2440 G$=G$+C$
2450 PRINT @ 66,G$
2499 RETURN
9999 GOTO 20
```

# *FROM* computer plus *TO YOU . . .*

SINCE 1973

*see us at* RAINBOWfest *CHICAGO*

## *A SPECTACULAR OFFER!*

SMITH-CORONA text printer
TOP OF FORM

## *A VERY AFFORDABLE*
## DAISY WHEEL PRINTER
## SMITH-CORONA TP-1

*ONLY*

**$235.00**

The Smith-Corona TP-1 text printer delivers fully-formed executive-quality daisy wheel characters at a speed of 12 characters per second. And features underlining, programmable margins, and programmable backspace (bold print). It takes single sheets of paper up to 13 inches wide. An optional continuous forms feed can be added at any time.

The printer has a serial data interface. It prints a 93 character ASCII set in either a 10 CPI or 12 CPI (characters per inch).

The Smith-Corona TP-1 is a simple, low-cost, and reliable text printer backed by the quality workmanship of Smith-Corona. The printer is compatible with most word processors. Now you can print letters, term papers, documents, forms, reports, price lists and data sheets with the quality image they demand and you deserve.

Take advantage of this one time offer from Computer Plus. Specify 10 CPI or 12 CPI. Available only while supplies last.

**CALL TOLL FREE**
**1-800-343-8124**

- *LOWEST POSSIBLE PRICES*
- *BEST POSSIBLE WARRANTY*
- *KNOWLEDGEABLE SALES STAFF*
- *TIMELY DELIVERY*
- *SHOPPING CONVENIENCE*

VISA AMERICAN EXPRESS MasterCard

**computer plus**

P.O. Box 1094
480 King Street
Littleton, MA 01460

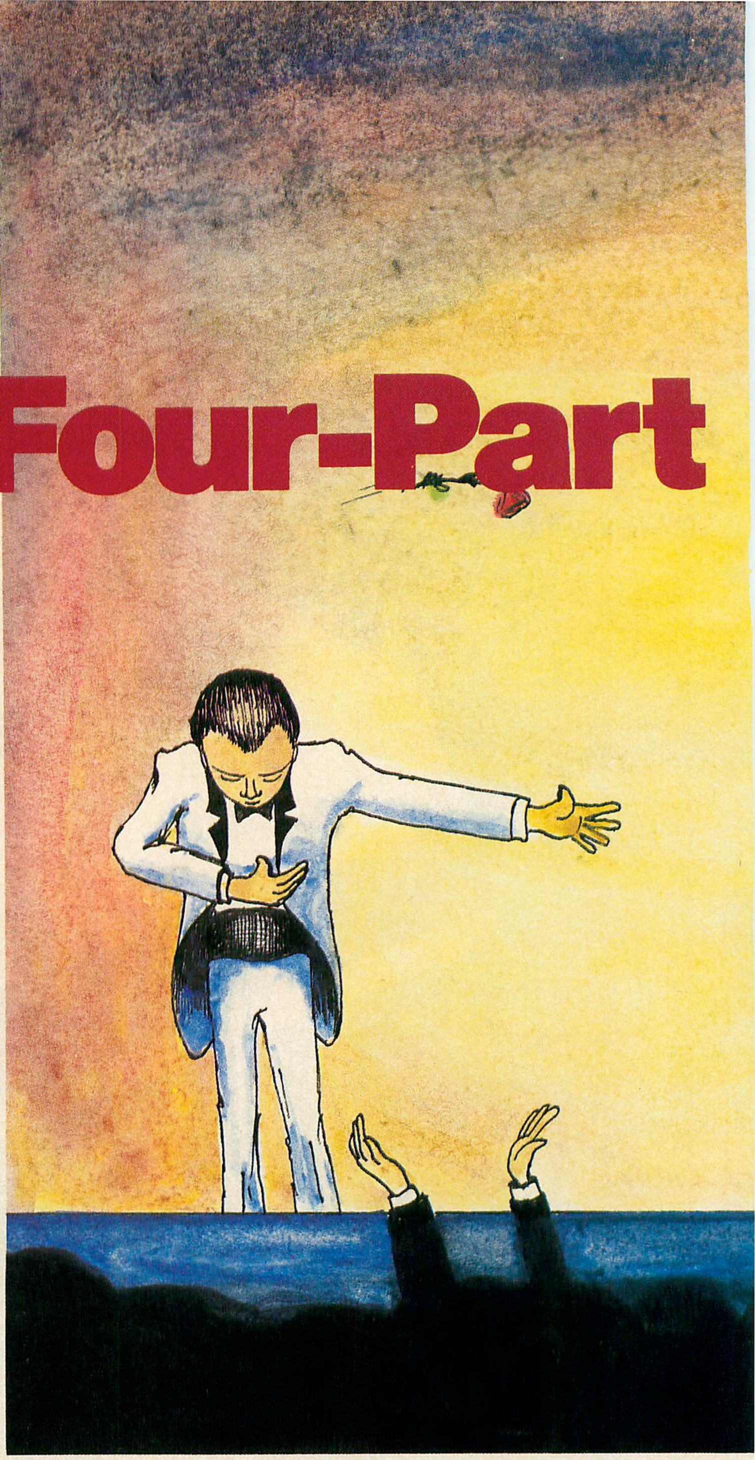
**SINCE 1973**

IN MASSACHUSETTS CALL (617) 486-3193

## MUSIC

*Blending past contributions to the field of computer composing,* Music+ *becomes a utility of harmony and power.*

# Making Four-Part



### By Bob Ludlum

If you enjoy making music with your CoCo you're going to find *Music+* to be a useful addition to your software repertory. It is a BASIC program which loads a machine language music synthesis program and provides a screen editor that facilitates the entry, editing, and playing of four-part music. It requires a 32K Color Computer with Extended BASIC and runs without modification on both tape and disk systems.

*Music+* is based on a solid foundation of contributions by others, notably Hal Chamberlain's music synthesis algorithm (*Byte*, September 1977), Clell Dildy's implementation of that algorithm in assembly language for the CoCo ('68 *Micro Journal*, February 1982), and Larry Konecky's BASIC screen editor *CoCo Composing* (RAINBOW, December 1983). *Music+* is in fact an extensively modified and expanded version of *CoCo Composing* with improvements in both the machine language synthesizer program and the BASIC screen editor/driver. I encourage you to read the referenced articles, especially the latter two since they apply directly to *Music+*.

I've included several helpful features in the program but by far the most important is the ability to accept music data input in familiar musical terms rather than in obscure numerical notation. For example, to input a quarter note you enter 4 (instead of 24 which is the actual number stored in memory that the program uses to generate a quarter note). A dotted 16th note is entered as 16 followed by a period (16.) and so on. Table 1 shows the note lengths that are accurately generated by the program. Since length numbers are stored as single bytes in memory they must be integers from 0 to 255. Lengths not shown in the table require non-integer values. Note that some of the "unusual" lengths are useful. For example, three 12th notes form an eighth note triplet.

**Table 1.**

Normal Notes: 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96
Dotted Notes: 1., 2., 3., 4., 6., 8., 12., 16., 18., 24., 36., 48., 72.

**Note Length Inputs For *Music+* (8=Eighth Note, etc.)**

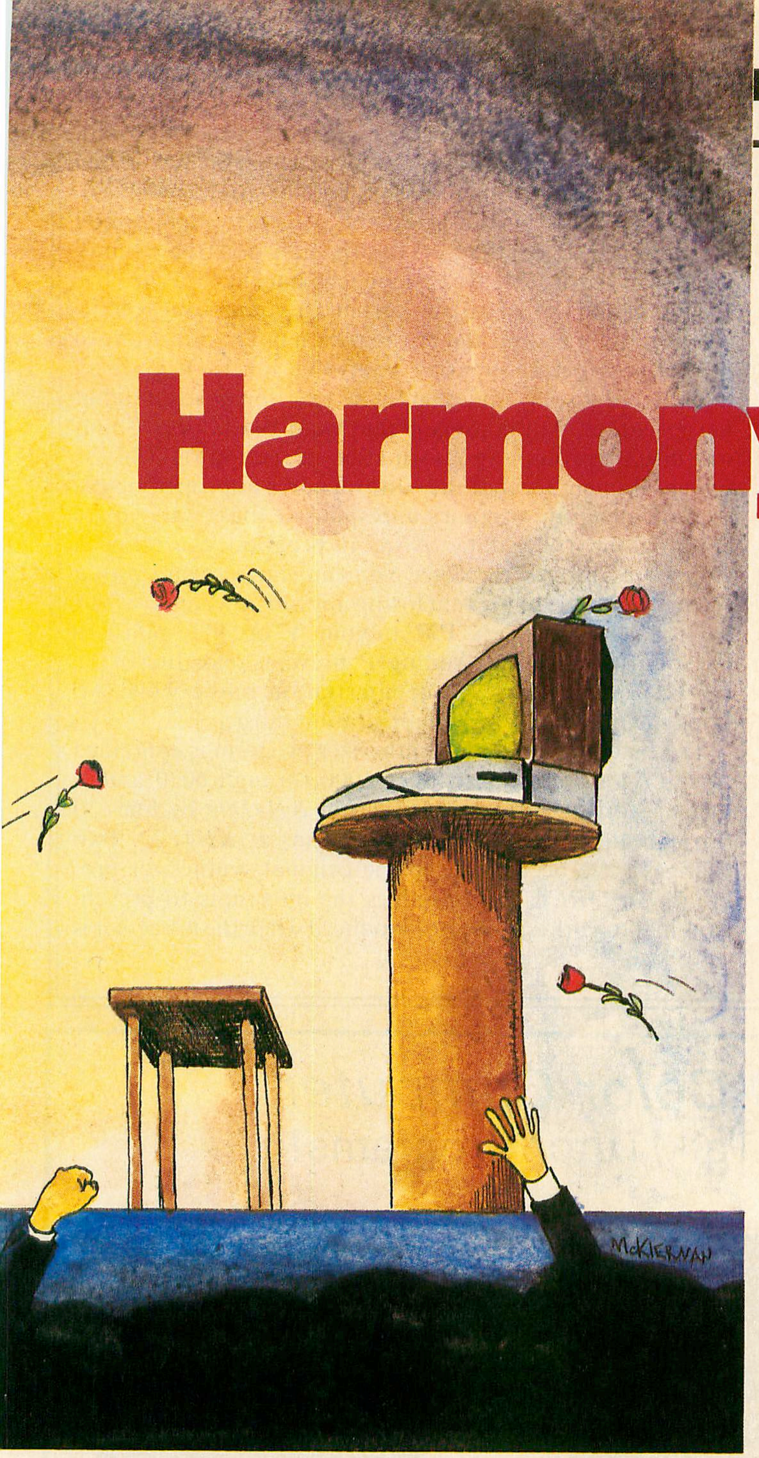
Pitch values are entered by using the actual note names such as C4# for a middle C sharp and A4 for the American Standard A note with a pitch (frequency) of 440 hertz. The program translates those symbols into the required numbers 52 and 68. Flatted notes are entered using the "-" such as E4-.

---

*(Bob Ludlum, an electronics design engineer for 20 years, holds a master's degree in electrical engineering and is a registered professional engineer. He has been a licensed amateur radio operator (K4LXA) for 28 years. Hobbies include electronics, personal computers, classical and flamenco guitar, and flying.)*

32K
ECB

# Harmony Easier



Note entries must include both the note name (A through G) and an octave number in the range of 2 through 6. The actual range of the synthesizer program is from C2 to E6 and the editor will ignore inputs outside that range. Sharps and flats are optional.

The program is quite easy to use. No *POKEs* are necessary to allocate memory, simply *CLOAD* from tape or *LOAD* from disk and *RUN*. The program then asks if it may use the "speed-up poke" to make the editor program execute more rapidly. The machine language program is then loaded into memory while credits are displayed. After a short demonstration tune is played, the screen changes to the editor mode.

Music data are stored in memory in five-byte groups for each note position. The first byte contains the length and the remaining four contain the pitch for each of the four notes (voices) at that position. The end of the music data must be marked with a length value of zero. The editor screen provides a "window" into memory through which the contents of five consecutive note groups can be viewed as numbered columns with the length at the top and the four voices below. The numbers from memory are translated back to the familiar symbols described above before being displayed.

The program arbitrarily translates flatted notes to the equivalent sharped notes since the number in memory for both is the same and it has no way of knowing which was entered. Column numbers may range from one to 2350, however there is room on the screen to display only three digits for each. Only the last three digits of column numbers greater than 999 are displayed but a red block to the right of the numbers signals when that condition exists. A black cursor is displayed which can be moved with the arrow keys to the desired location in the window for entering or changing data. Pressing the Space Bar changes the cursor to red. New lengths or notes may then be keyed in followed by pressing an arrow key. The cursor will change to black and advance to the next location in the direction of the arrow. The program will automatically return to the black cursor anytime it has received the maximum data for that location. For example, a length entry ending with a dot or a note entry ending with a sharp or flat. Also, an entry of zero immediately following the red cursor will enter that value and return to the black cursor.

The editor will accept only the proper inputs. For example, in a note location it will accept only the letters A through G followed by an octave number from two through six followed by either a sharp, a flat, or an arrow key. Length locations will accept only a one- or two-digit number followed by a dot or an arrow key. To enter a rest, enter the desired length and enter a zero for each note you wish to be silent. Ninety-sixth rests are useful for separating repeated notes so that they don't sound as one continuous note.

Displayed in the upper-left corner of the screen are three numbers related to cursor activity. HC is the highest column number (note position) to which the cursor has been moved, HM is the highest memory location to which the cursor has been moved, and CL is the memory location of the current cursor position.

Near the bottom of the screen is displayed a menu of single-letter editor commands. Pressing the '@' key toggles the display between two command menus. All the commands are available for use regardless of which menu is being displayed. Pressing 'P' for (P)lay plays the music from note position 1 to the first note position with a length equal to zero. (J)ump rapidly moves the display "window" to the selected note position. (I)nsert and (R)emove allow the insertion and removal of note positions specified by the current cursor location. (S)ave and (L)oad allow music to be saved to or loaded from either tape or disk. Since the synthesizer program is saved with the music data, the music may be played without using *Music+* by loading the saved music with a *CLOADM* or *LOADM* followed by *EXEC*. (T)empo allows the tempo to be changed. The current tempo is always displayed at the bottom of the screen in units of quarter notes per minute. Like the length, the tempo number is stored as an integer. So the displayed tempo is sometimes slightly different from the number you enter due to truncation of the calculated tempo number. Enter tempos less than 100 with a leading zero (such as 090).

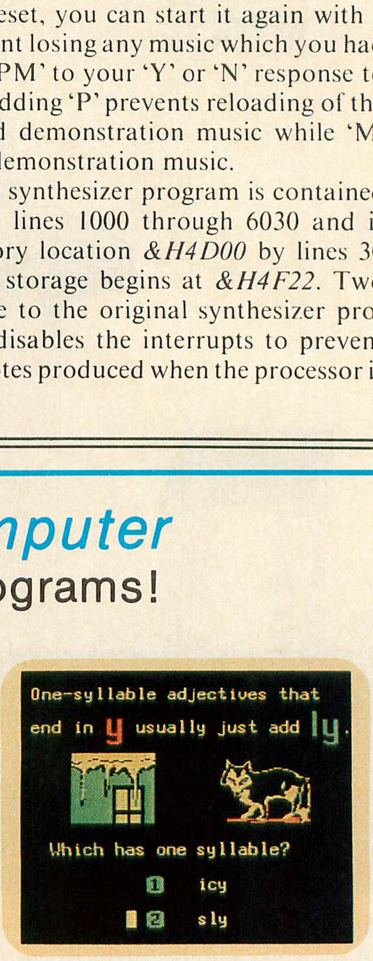
(K)opy implements the repeat function by copying a block of music data between two selected note positions to a selected destination. (M)ove allows playing a part of the music by playing from a selected note position to the end. Any portion of the music can be played by temporarily inserting a zero length at the desired note position to mark the end and using (M)ove to define the starting location. The last command (Z)ero calls a short machine language routine which rapidly sets all the music data memory locations to zero. Use it before entering your own music. It gives an uncluttered display and guarantees that you have an end of music marker. Any command that requires additional input will display prompting information at the top right of the screen. Remember that the editor ignores improper inputs, so if the program becomes unresponsive make sure you're entering the right data. Also, if program execution is stopped by BREAK or Reset, you can start it again with a *RUN*. However, to prevent losing any music which you had entered, add the letters 'PM' to your 'Y' or 'N' response to the speed-up question. Adding 'P' prevents reloading of the synthesizer program and demonstration music while 'M' skips the playing of the demonstration music.

The machine language synthesizer program is contained in *DATA* statements in lines 1000 through 6030 and is loaded starting at memory location *&H4D00* by lines 30 through 40. Music data storage begins at *&H4F22*. Two changes have been made to the original synthesizer program. An *ORCC #$50* disables the interrupts to prevent gaps in the synthesized notes produced when the processor is

NEW! For Your TRS-80 Color Computer
320 Full-time Audio Talk/Tutor Programs!

You may be able to reduce your taxes by
- income averaging
- income splitting
- tax shelter

Which?
1 sister
2 smaller


One-syllable adjectives that end in y usually just add ly.
Which has one syllable?
1 icy
2 sly

We're Your Educational Software Source

| Course | No. of Programs |
|---|---|
| Language Arts (Spelling) | 16 Programs |
| Reading | 64 Programs |
| Comprehension | 32 Programs |
| Phonics | 32 Programs |
| English as a Second Language | 32 Programs |
| Mathematics | 64 Programs |
| Basic Algebra | 16 Programs |
| Physics | 16 Programs |
| Effective Writing | 16 Programs |
| History | 32 Programs |

In Color, with Pictures and Text!

All of our TRS-80 Color programs have easy to understand professional announcer narration, not synthesized, robotic voices. All text is displayed in easy to read upper- and lower-case characters. Video clearly illustrates key concepts in each frame of the program.

Only **$4.40** per program (**$8.80** for 2, one on each side of a half-hour cassette). **$59.90** for 16 programs (8 cassettes) in an album. Send for catalog of over 1000 programs for Atari, TRS-80, Apple, etc.

Dealer inquiries welcome
For more information, or to order call:

**TOLL FREE 1-800-654-3871**
**IN OKLAHOMA CALL (405) 288-2301**

**DORSETT**
**Educational Systems, Inc.**
**Box 1226, Norman, OK 73070**

MasterCard
VISA

"borrowed" to service the interrupts. Variables used by the synthesizer program are stored from *&H4CC0* to *&H4CD6*. Accessing these variables using extended addressing requires more opcode bytes and therefore more time to execute. The extra time required slows the software timing loops used to generate the lengths and pitches of the notes. The resulting notes are detuned downward from standard pitch. To solve this problem the program sets the direct page register to *&H4C* and uses direct addressing. That restores correct loop timing using the original note table values and gives accurate tuning. The direct page register is reset to zero before returning to the editor after a song is played.

*Music+* enhancements to *CoCo-Composing* have been interspersed throughout the program but most of the added features are contained in new lines 6499 through 10000. The original line numbering has been maintained where possible. The most significant modifications of the original code were to the function select routine beginning at line 100 where the new commands were added and the input method changed to give quicker key response, and in the procedures for returning to the black cursor following data entry. All the changes were to make data entry easier and more automatic where possible.

I hope you find the program as enjoyable and helpful as I have. As a beginning student of classical guitar, I've found it to be a valuable tool in learning to read and count properly. It's also helpful in learning duets. It's great fun to "play" with the Color Computer, especially when you let it do the hard part!

**Editor's Note: A song file, "Country Roads," follows *Music+* on this month's RAINBOW ON TAPE.**

| | | | |
|---|---|---|---|
| 18 | 35 | 2020 | 45 |
| 55 | 39 | 5080 | 133 |
| 130 | 177 | 6120 | 8 |
| 347 | 1 | 6152 | 212 |
| 412 | 91 | 6500 | 249 |
| 660 | 237 | 7999 | 202 |
| 800 | 187 | 8160 | 42 |
| 999 | 10 | 9155 | 255 |
| 1160 | 103 | 9300 | 15 |
| 1399 | 85 | END | 127 |

**The listing:**

```
0 '********************************
1 '* MUSIC+ BY BOB LUDLUM  226 *
2 '* PINERIDGE DR. PANAMA CITY,*
3 '* FL.,32405. AN ENHANCED    *
4 '* VERSION OF LARRY KONECKY'S*
5 '* COCO-COMPOSING  (RAINBOW  *
6 '* MAGAZINE  DECEMBER, 1983) *
7 '********************************
8 ' LAST REVISION 3/11/84 16:50
12 GOTO 10000:REM LINES 12,13,14
```

# The Original FLEX™ for Color Computers

- Upgrade to 64K
- RS to FLEX, FLEX to RS file transfer ability
- Create your own character set
- Automatic recognition of single or double density and single or doubled sided
- All features available for either single or multiple drive systems
- Settable Disk Drive Seek Rates
- Faster High Resolution Video Display with 5 different formats
- Save RS Basic from RAM to Disk
- Move RS Basic to RAM
- Load and save function on FLEX disk
- 24 Support Commands 12 with Source Text
- External Terminal Program

Languages Available

Pascal, Fortran, RS Basic, RS Assembler, TSC Basic, TSC Assembler, Relocating Assembler, Macro Assembler, Mumps

If you are tired of playing games on your TRS-80C Color Computer, or find that you are handicapped by the limitations of the RS BASIC in trying to write a Program that will allow you to actually USE the Color Computer as a COMPUTER. YOU ARE READY TO MOVE UP TO THE **FLEX9** Operating System. If you want to have REAL PROGRAMMING POWER, using an Extremely Powerful Business BASIC, PASCALs, C Compilers, a full-blown Macro Assembler with a Library capability so you are not continuously reinventing the wheel. YOU ARE READY TO MOVE UP TO THE **FLEX9** Operating System. If you would like to see if YOU REALLY COULD USE A COMPUTER IN YOUR BUSINESS, or begin to make your Computer start PAYING IT'S OWN WAY by doing some Computer Work for the millions of small businesses around you, such as Wordprocessing, Payroll, Accounting, Inventory, etc., then YOU ARE READY TO MOVE UP TO THE **FLEX9** Operating System. How?? **DATA-COMP** has the way!

**DATA-COMP**'s FLEX9 Conversion for the TRS-80C Color Computer was designed for the SERIOUS COMPUTER **USER**; with features like greatly increased Display Screens, WITH Lower Case Letters, so you can put a FULL Menu on ONE Screen, or see SEVERAL Paragraphs at the same time; with features like providing a FULL Keyboard so you have FULL Control of your Computer AND it's Programs NATURALLY, without needing a chart to see what Key Combination will give you what function; with USER ORIENTED functions to make using the Operating System natural, like having the Computer AUTOMATICALLY determine what type of Disk is being used in what type of Disk Drive and working accordingly, rather that you have to specify each and every thing for it, or like having the Computer work with the Printer you have been using all along without you having to tell the new Operating System what is there, etc.

™FLEX is a trademark of Technical Systems Consultants

**DATA-COMP has everything you need to make your TRS-80C Color Computer WORK for YOU; from Parts and Pieces to Full, Ready To Use SYSTEMS. DATA-COMP designs, sells, services, and SUPPORTS Computer SYSTEMS, not just Software. CALL DATA-COMP TODAY to make your Computer WORK FOR YOU!**

**System Reguirements**

| | |
|---|---|
| **FLEX9** Special General Version x Editor & Assembler (which normally sell for $50.00 ea.) | $150.00 |
| **F-MATE(RS)** FLEX9 Conversion Rout. for the RS Disk Controiler | |
| when purchased with Special General FLEX9 Sys. | $49.95 |
| when purchased without the General FLEX9 Sys. | $59.95 |
| **Set of Eight 64K RAM Chips** w Mod. Instructions | $59.95 |
| **Color Computer with 64K RAM** and EXT. BASIC | $399.95 |

**SPECIAL SYSTEM PACKAGES**

**64K Radio Shack COLOR COMPUTER, Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, Special General Version of FLEX9, F-MATE(RS) and a Box of 10 Double Density Diskettes; a COMPLETE, ready to run SYSTEM on your Color TV Set. $1079.95**

**DISK DRIVE PACKAGES, etc.**

These Packages **include** the Radio Shack Disk Controller, Disk Drives with Power Supply and Cabinet, and Disk Drive Cable:

| | |
|---|---|
| **PAK #1** — 1 Single Sided, Double Density Sys. | $489.95 |
| **PAK #2** — 2 Single Sided, Double Density Sys. | $749.95 |
| **PAK #3** — 1 Double Sided, Double Density Sys. | $569.95 |
| **PAK #4** — 2 Double Sided, Double Density Sys. | $919.95 |
| **PAK #5** — 2 Qume Thinline Double Sided Double Density Sys. | $749.95 |

**PARTS AND PIECES**

| | |
|---|---|
| Radio Shack Disk Controller | $179.95 |
| 1 Single Sided, Double Density Disk Drive Tandon | $249.95 |
| 1 Double Sided, Double Density Disk Drive Qume | $349.95 |
| 1 Qume Thinline Double Sided, Double Density | $279.95 |
| Screen Clean — Clears Up Video Distortion On Your Color Computer | $39.95 |
| Single Drive Cabinet with Power Supply | $89.95 |
| Double Drive Cabinet with Power Supply | $109.95 |
| Single Drive Disk Cable for RS Controller | $24.95 |
| Double Drive Disk Cable for RS Controller | $34.95 |
| Micro Tech. Prods., Inc. **LOWER CASE ROM** Adapter | $74.95 |
| Radio Shack BASIC **Version 1.1 ROM** | $34.95 |
| Radio Shack Extended Basic ROM | $89.95 |

**DATA-COMP**
**P.O. Box 794** ***HIXSON, TN 37343***
**1-615-842-4601**

```
,AND 10000 ARE ROM PCLEAR BUG FI
X
13 GOTO 15
14 PCLEAR1:GOTO13
15 CLEAR200,&H4CBF:CLS:PRINT" DO
ES YOUR COLOR COMPUTER WORK":PRI
NT" WITH THE SPEED-UP POKE":INPU
T" (POKE65495,0)  (Y/N)";QQ$:IF
LEFT$(QQ$,1)="Y" THEN QQ=1 ELSE
QQ=0
16 CLS2:PRINT@72," *** MUSIC+ **
* ";:PRINT@132," AN ENHANCED VER
SION OF ";:PRINT@164,"    LARRY
KONECKY'S     ";:PRINT@196," ***
 COCO COMPOSING *** ";
17 PRINT@231," RAINBOW DEC 1983
";:P7$="L50;V5;A":POKE65494+QQ,0
18 A5=&H4F22:A1=&H4D00:A2=&H4E83
:A3=&H4E84:A4=&H4F21:A6=&H4CD7:A
7=&H4CE2:A8=&H4ECD:A9=&H4EA0:DIM
 P(5,5):TT=17113
19 PRINT@353," PLEASE TURN TV VO
LUME UP AND ";:PRINT@385," WAIT
A FEW SECONDS.........  ";
20 P$=CHR$(128):C$=CHR$(143):R$=
CHR$(255):B$=CHR$(175)
21 X$="C C#D D#E F F#G G#A A#B "
25 FORA=1TO5:FORB=1TO5:P(A,B)=Q:
Q=Q+1:NEXTB,A
27 Q1$=MID$(QQ$,2,1):Q2$=MID$(QQ
$,3,1):IF Q1$="P" OR Q2$="P" THE
N 50
30 FORD=A1 TO A2:READT:POKED,T:N
EXT
40 FORD=A3 TO A4:READP:POKED,P:N
EXT
42 FORD=A6 TO A7:READP:POKED,P:N
EXT
45 FORD=A5 TO A5+404:READT:POKED
,T:NEXT
50 DEFUSR0=A3:DEFUSR1=A6
52 CLS2:PRINT@73," ** MUSIC+ **
";:PRINT@137," ENHANCEMENTS ";:P
RINT@205," BY ";:PRINT@266," BOB
 LUDLUM ";
53 PRINT@293," 226 PINE RIDGE DR
IVE ";:PRINT@322," PANAMA CITY,
FLORIDA 32405 ";
54 FORI=1TO200:NEXTI:PRINT@385,"
 HERE'S A BIT OF 'TOY FOR TWO ";
:PRINT@417," LUTES' FROM ROBINSO
N'S 'THE  ";:PRINT@449," SCHOOLE
 OF MUSICKE' (1603)   ";
55 IF Q1$="M" OR Q2$="M" THEN 56
 ELSE C=USR0(0)
56 M=A5
57 PE=PEEK(M):IF PE=0 THEN J=M-1
:GOTO 60
```

```
58 M=M+5:GOTO57
60 POKE65494+QQ,0:GOSUB500:Z=1:S
=139:X=1:Y=1:M=A5
70 GOSUB400:PRINT@S,P$;
99 '* FUNCTION SELECT
100 PRINT@1,"HC ";INT((J-A5+5)/5
);:PRINT@65,"CL";M;
101 I$=INKEY$:IF I$="" THEN 101
ELSE LV=ASC(I$)
102 IF LV=94 THEN 250 'UP
105 IF LV=10 THEN 280 'DOWN
110 IF LV=8 THEN 320 'LEFT
115 IF LV=9 THEN 350 'RIGHT
116 IF LV=90 THEN 9400 '(Z)ERO M
USIC MEMORY
117 IF LV=75 THEN 9200 '(K)OPY
120 IF LV=80 THEN 600 'PLAY
122 IF LV=64 THEN GOSUB 9000 'AL
TERNATE MENU @
123 IF LV=84 THEN 9100 'TEMPO
125 IF LV=83 THEN 625 'SAVE
130 IF LV=76 THEN 700 'LOAD
131 IF LV=74 THEN 900 'JUMP
132 IF LV=73 THEN 930 'INSERT
133 IF LV=82 THEN 950 'REMOVE
134 IF LV=77 THEN 9300 'MOVE PLA
Y START
135 IF LV=32 THEN 136 ELSE 101 '
SPACE BAR
136 PRINT@S,R$;:IF X=1 THEN GOSU
B 7000 ELSE GOSUB 8000
140 IF TV=94 THEN  250 ELSE IF T
V=10 THEN  280 ELSE IF TV=8 THEN
  320 ELSE IF TV=9 THEN  350
141 GOTO 100
249 '* UP ARROW
250 IFX=1THEN100
255 X=X-1:PRINT@S,C$;:IFX=1THENS
=S-64ELSES=S-32
270 PRINT@S,P$;:M=M-1
272 GOTO100
279 '* DOWN ARROW
280 IFX=5THEN100
285 X=X+1:PRINT@S,C$;:IFX=2THENS
=S+64ELSES=S+32
300 PRINT@S,P$;:M=M+1:IFM>J THEN
J=M:PRINT@33,"HM";J;
310 GOTO100
319 '* LEFT ARROW
320 IFY=1 AND M<A5+5THEN100
325 IFY=1THEN340
330 Y=Y-1:PRINT@S,C$;:S=S-4:PRIN
T@S,P$;:M=M-5
335 GOTO100
340 Z=Z-1:M=M-(P(Y,X)+5):SS=S:S=
139:GOSUB400
345 S=SS:PRINT@S,P$;:M=M+P(Y,X)
347 GOTO100
```

```
349 '* RIGHT ARROW
350 IFY=5AND M>32760THEN100
355 IFY=5THEN380
360 Y=Y+1:PRINT@S,C$;:S=S+4:PRIN
T@S,P$;:M=M+5:IFM>J THENJ=M:PRIN
T@33,"HM";J;
370 GOTO100
380 Z=Z+1:M=M-(P(Y,X)-5):SS=S:S=
139:GOSUB400
385 S=SS:PRINT@S,P$;:M=M+P(Y,X):
IFM>J THENJ=M:PRINT@33,"HM";J;
390 GOTO100
399 '* WINDOW DISPLAY
400 PRINT@33,"HM";J;:PRINT@75,"
                    ";
402 PRINT@75,RIGHT$(STR$(Z),3)"
";:PRINT@79,RIGHT$(STR$(Z+1),3)"
 ";:PRINT@83,RIGHT$(STR$(Z+2),3)
" ";:PRINT@87,RIGHT$(STR$(Z+3),3
)" ";:PRINT@91,RIGHT$(STR$(Z+4),
3)" ";:PRINT@95,B$;
403 IF Z+4>999 THEN PRINT@95,R$;
 ELSE PRINT@95,B$;
404 FORA=1TO5:FORB=1TO5
406 N=PEEK(M):IFN<1ORN>144THENN=
0:POKEM,N:N1$="0":GOTO 420
408 IF B<>1 THEN 415
410 NN=96/N:N1$=STR$(NN):N1$=RIG
HT$(N1$,LEN(N1$)-1):IF (NN-INT(N
N))<>0 THEN NN=144/N:N1$=STR$(NN
):N1$=RIGHT$(N1$,LEN(N1$)-1)+"."
412 GOTO 420
415 GOSUB 6500
420 PRINT@S,"    ";:PRINT@S+1,N1
$;:M=M+1:IFA=5THENPRINT@S+4,B$;
425 IFB=1THENS=S+64ELSES=S+32
430 IFB=5THENS=S-188
435 NEXTB,A:M=M-25:S=139:RETURN
499 '* WINDOW LABELS
500 CLS3:PRINT@12," * ENTER MUSI
C * ";:B7$="           ":PRINT@1,B
7$;:PRINT@33,B7$;:PRINT@65,B7$;
502 T9=256*PEEK(A8)+PEEK(A8+1):T
9=TT/T9:PRINT@489," TEMPO =
 ";:PRINT@497,USING"###";T9;
505 PRINT@44,"   (SPACE BAR)    "
;
510 PRINT@129," LENGTH  ";
520 PRINT@193," VOICE 1 ";
530 PRINT@225," VOICE 2 ";
540 PRINT@257," VOICE 3 ";
550 PRINT@289," VOICE 4 ";
560 PRINT@353," CURSOR(ARROWS) :
 MENU(@ KEY) ";
570 MF=1:GOSUB9000
580 RETURN
599 'PLAY MUSIC
600 CLS2:PRINT@230," MUSIC PERFO
RMANCE ";:POKE65494,0:POKEA9,0:P
OKEA9+1,128:C=USR0(0):GOTO60
624 '* SAVE
625 POKE65494,0:CLS8:PRINT@9," *
SAVE MUSIC* ";:GOSUB800
630 IFT=1THENPRINT@8," *SAVE TO
DISK* ";ELSEPRINT@7,"*SAVE TO CA
SSETTE*" ;
660 PRINT@96," 8 OR LESS CHARACT
ERS"
665 INPUT T$
675 FORQ=J+1TOJ+5:POKEQ,0:NEXTQ
680 IF T=1 THEN 681 ELSE IF T=-1
 THEN 682 ELSE 60
681 SAVEM T$,A1,Q,A3:GOTO 60
682 CSAVEM T$,A1,Q,A3:GOTO 60
685 GOTO60
699 '* LOAD
700 POKE65494,0:CLS4:PRINT@9," *
LOAD MUSIC* ";:GOSUB800
710 IFT=1THENPRINT@7," *LOAD FRO
M DISK* ";ELSEPRINT@5," *LOAD FR
OM CASSETTE* ";
735 PRINT@96," (MUST BE EXACT) "
740 INPUTT$
745 PRINT@199," WAIT ONE MOMENT
";
750 IFT=1THEN LOADM T$ ELSE CLOA
```

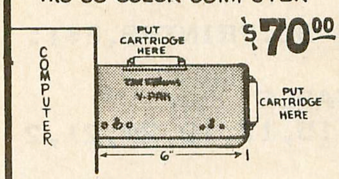
SOFTWARE-HARDWARE

FOR RADIO SHACK'S TRS-80 MODEL 1/3
TRS-80 COLOR COMPUTER

•SEND FOR FREE CATALOG•

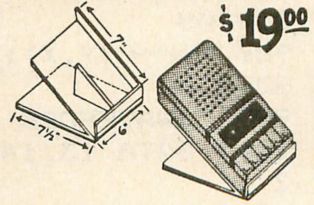
UTILITY PROGRAMS ON CASSETTE
SU-1 CASSETTE COPY $10.00
SU-2 CASSETTE DUMP $10.00
SPECIFY COMPUTER

Y-PAK
TRS-80 COLOR COMPUTER
$70.00



TURN YOUR COMPUTER INTO A 2-SLOT SYSTEM. SWITCH BETWEEN THE TWO WITH EASE.

RECORDER STAND
$19.00



MADE OF STURDY PLASTIC. HOLDS RECORDER AT A PERFECT ANGLE.

RAM/ROM USER-PAK FOR TRS-80 COLOR $30

•GAMES ALSO AVAILABLE•

B.ERICKSON SOFTWARE·P.O.BOX 11099·CHICAGO IL 60611
CALL (312)276-9712 FOR INFORMATION

```
DM T$
760 M=A5
761 PE=PEEK(M):IFPE=0THENJ=M-1:G
OTO60
765 M=M+5:GOTO761
799 '* DISK OR CASSETTE
800 PRINT@64," SELECT (D)ISK OR
 (C)ASSETTE":PRINT@96,"   PRESS
SPACE BAR TO RETURN"
810 I$=INKEY$:IFI$=""THEN810
820 IFI$="D"THENT=1:GOTO850
835 IFI$="C"THENT=-1:GOTO850
840 IFI$=" "THEN60ELSE810
850 PRINT@64," ENTER TITLE:":RET
URN
899 '* JUMP
900 PRINT@44," JUMP TO COLUMN  "
;
905 PRINT@12,R$" SELECT#       "
R$;:PRINT@22,;:INPUTZ:PRINT@29,B
$+B$+B$;:IFZ<1 OR Z>2350THEN905
910 S=139:X=1:Y=1:M=(Z-1)*5+A5
920 IFM>J THENJ=M
925 PRINT@12," * ENTER MUSIC * "
;B$+B$+B$;:PRINT@44,"   (SPACE B
AR)   ";:GOTO70
929 '* INSERT
930 PRINT@S,R$+R$+R$+R$;:M=M-(X-
1):J=J+5:FORK=J TOM STEP-1:N=PEE
K(K):POKE(K+5),N:NEXTK:FORK=M TO
(M+4):POKEK,0:NEXTK
935 S=S-(X-1)*32:IFX>1THENS=S-32
940 X=1:M=M-P(Y,X):SS=S:S=139:GO
SUB400
945 M=M+P(Y,X):S=SS:PRINT@S,P$;:
GOTO100
949 '* REMOVE
950 IF M<(A5+5) AND J<(A5+5) THE
N 100 ELSE PRINT@S,R$+R$+R$+R$;:
M=M-(X-1):FORK=M TOJ:N=PEEK(K+5)
:POKEK,N:NEXTK:J=J-5
960 S=S-(X-1)*32:IFX>1THENS=S-32
970 X=1:M=M-P(Y,X):SS=S:S=139:GO
SUB400
980 M=M+P(Y,X):S=SS:PRINT@S,P$;:
GOTO100
999 '*WAVEFORM TABLE
1000 DATA 13,14,15,17,18,20,21,2
2
1010 DATA 24,25,27,28,29,31,32,3
4
1020 DATA 35,38,39,41,42,43,45,4
6
1030 DATA 48,49,50,52,53,55,56,5
6
1040 DATA 57,59,59,60,60,62,62,6
2
1050 DATA 63,63,63,63,63,63,63,6
2
1060 DATA 62,62,60,60,59,59,57,5
6
1070 DATA 55,55,53,52,50,49,48,4
6
1080 DATA 46,45,43,42,41,39,38,3
6
1090 DATA 35,34,32,31,31,29,28,2
7
1100 DATA 27,25,25,24,24,22,22,2
1
1110 DATA 21,21,21,21,21,21,21,2
1
1120 DATA 21,21,21,21,22,22,22,2
4
1130 DATA 24,24,25,25,26,26,27,2
7
1140 DATA 27,28,28,30,31,31,32,3
2
1150 DATA 34,34,34,34,34,35,35,3
5
1160 DATA 35,35,35,35,34,34,34,3
4
1170 DATA 32,32,32,31,31,29,29,2
8
1180 DATA 28,27,25,25,24,22,21,2
1
1190 DATA 20,18,18,17,15,14,14,1
3
1200 DATA 11,11,10,08,08,07,07,0
6
1210 DATA 06,04,04,03,03,03,01,0
1
1220 DATA 01,01,01,01,00,00,00,0
0
1230 DATA 00,01,01,01,01,01,01,0
1
1240 DATA 03,03,03,03,03,04,04,0
4
1250 DATA 04,04,06,06,06,06,06,0
6
1260 DATA 06,06,07,07,07,07,07,0
7
1270 DATA 07,06,06,06,06,06,06,0
6
1280 DATA 06,06,04,04,04,04,04,0
4
1290 DATA 04,04,04,04,03,03,03,0
4
1300 DATA 04,04,04,04,04,06,06,0
6
1310 DATA 07,07,07,08,10,10,11,1
3
1399 '*NOTE TABLE
1400 DATA 0,0,2,111,2,148,2,187
1410 DATA 2,228,3,16,3,63,3,113
1420 DATA 3,165,3,220,4,23,4,86
1430 DATA 4,152,4,221,5,40,5,118
```

# The Joystick that sets you free!

The one-hand operation of this fantastic new joystick will truly set you free and increase the pleasure of playing your favorite video games. The smoothness and responsiveness of this unique joystick that operates completely without a base is something to be experienced. Available direct from us or from your independent computer retail store. (See below)

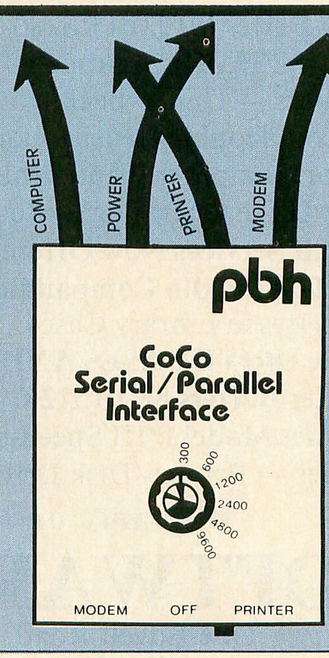
**$49.95** suggested retail

---

**STOP** changing Printer and Modem Cables! Our **Parallel Printer Interface** provides **Switch Selectable Printer** or **Modem** operations for both CoCo and MC10. It features switchable baud rates from 300 to 9600. It comes complete with power supply, modem cable and **"Centronics"** type printer cable. For Basic 1.1 and later revisions.

Available direct from us or from your independent computer retail store. (See below)

**Only $89.95** suggested retail



**pbh Computer Products, Inc.**
P. O. Drawer 55868
Houston, Texas 77055
713/956-0207

When ordering direct from **PBH** please enclose $3.00 per item for shipping.

**Stocking Distributors**

Compukit
Houston, TX. 77059

Spectrum Projects
Woodhaven, N.Y. 11421

**Authorized Dealers**

Endicott Computer
Software & Accessories
Huntsville, AL. 35801

The Computer Store
Jasper, IN. 47456

The Software Connection
Ft. Lauderdale, FL. 33319

Colorware, Inc.
Woodhaven, N.Y. 11421

TRS TECH
Computer Services
Houston, TX. 77033

Computers & More
Huntsville, TX. 77340

The Photo Shop Radio Shack
Wilmar, MN. 56201

Patterson Electronics
Mountain View, AR. 72560

Computers, Etc.
Austin, TX. 78745

Cinsoft
Cincinnati, OH. 45237

EDC Industries
Los Angeles, CA. 90042

Sound Center Radio Shack
Whiterock, N.M. 87644
& Los Alamos, N.M. 87544

Chips, Incorporated
Atlanta, GA. 30340

Computer Associates
West Fargo, N.Dak. 58078

Computer Plus, Inc.
Littleton, MA. 01460

Turtle Micro Ware
East Lime, CT. 06333

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

# PRICE BREAKTHROUGH

## Super Sale on New Disk Drives

Starting at **~~$169.00~~!** NEW LOW PRICE

**Tandon — Siemens — Remex — MPI — Teac — Shugart — Tabor**

40 or 80 Tracks — Single or Dual Head — New 3½" Drivette™
Our Disk Drives are Capable of Single **and** Dual Density Operation
The **NEWEST** Technology Capable of Operating on Most Popular Computers

**Drive a Hard Bargain!!™ For your TRS/80, Color Computer, IBM, Apple, Franklin**
**5 M.B.-20 M.B. Complete Systems......from $999.95**

**Diskette Breakthrough — 10 Pack in Library Case — ~~$18.95~~** NEW LOW PRICE

**SAVE!! PLEASE CALL FOR OUR MOST CURRENT PRICE REDUCTIONS.**

**TOLL FREE ORDERING**
**1-800-343-8841**

**GENERAL AND TECHNICAL**
**1-617-872-9090**

Disk Drives (0123) TRS/80-IBM-Apple - TI Franklin-Max/80-LNW ..... ◄
Model I/III/IV Upgrade (Disk Drives - Memory)..................... ◄
**Printers** — Daisywheel/Dot Matrix ..................... ◄
Percom Double Density Controller (Model I) ..................... ◄
Color Computer Printer Interfaces..................... ◄
Disk Drive Operating Systems ..................... ◄
**Repair Services** Now Offered — FAST Turn-a-Round..................... ◄
**Apple/Franklin Compatible Add-On Drives with Case & Cable**.......... ◄
Diskettes in Library Cases ..................... ◄

**CALL TOLL FREE FOR NEW PRICES**

**DISK DRIVE CASES AND POWER SUPPLIES** ......... starting at $59.95
Printer **Buffers** 8K to 512K .................... starting at $143.95
Holmes Model I/III Speed-up Mod .................... starting at $90.00
Cables — Printer/Disk Drive .................... starting at $23.00

**Warranty on Disk Drives — 6 Months to 1 Year**

# SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701 (617) 872-9090
Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

**DEALER INQUIRIES INVITED.**

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.

**CANADA**
**MICRO** R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 845-1534**
**Canadian Toll Free 800-361-5155**

**Service! Service!**

*All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.*

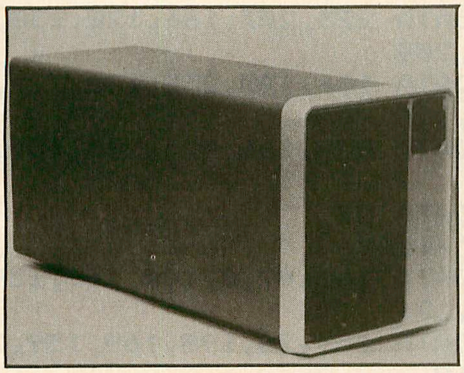
TRS/80 Registered Trademark Tandy Corp. IBM-PC Registered IBM Corp. Apple Registered Trademark Apple Computer Corp.
Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

# PRICE BREAKTHROUGH

## Super Sale on New Disk Drives



Introducing

## MEGADISK

5 to 20 Megabyte, ready to run on the TRS 80 Model I/III/IV/4P, color computer, I.B.M. PC, Apple, Franklin

**DRIVE A HARD BARGAIN**™ **Complete Systems Starting at $999.95**

**Call Toll Free Ordering 1-800-343-8841**

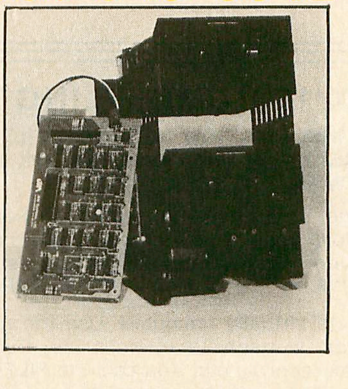
High Quality Lowest Price

**Drive 0, 1, 2, 3**

for the

**Color Computer**

**Starting at $199.95**



**Disk Drive Upgrade**

for model III/IV easy to install system

**Starting at ~~$369.95~~**

Call for new lower price

# SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701 (617) 872-9090
Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

**DEALER INQUIRIES INVITED.**

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.

**CANADA**
**MICRO R.G.S. INC.**
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 845-1534**
**Canadian Toll Free 800-361-5155**

**Service! Service!**

*All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.*

TRS/80 Registered Trademark Tandy Corp. IBM-PC Registered IBM Corp. Apple Registered Trademark Apple Computer Corp.
Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

```
1440 DATA 5,201,6,33,6,127,6,226
1450 DATA 7,74,7,185,8,47,8,172
1460 DATA 9,48,9,187,10,80,10,23
7
1470 DATA 11,147,12,67,12,254,13
,196
1480 DATA 14,149,15,115,16,95,17
,88
1490 DATA 18,96,19,119,20,160,21
,218
1500 DATA 23,38,24,135,25,252,27
,136
1510 DATA 29,43,30,231,32,190,34
,176
1520 DATA 36,192,38,239,41,64,43
,180
1530 DATA 46,77,49,14,51,249,55,
16
1540 DATA 58,87,61,207,65,124,69
,96
1550 DATA 73,129,77,223,82,129,8
7,105
1560 DATA 92,155,98,29
2000 '*INITIALIZE
2010 DATA 22,0,136,134,76,31,139
,134
2020 DATA 63,183,255,35,26,80,48
,141
2030 DATA 254,106,159,195,159,19
8,159,201
2040 DATA 159,204,48,141,0,128,1
59,192
2050 DATA 57
3000 '*READ LENGTH
3010 DATA 158,192,166,128,151,19
4
3020 DATA 57
4000 '*GET NOTES FROM TABLE
4010 DATA 49,141,255,80,166,128,
238,166
4020 DATA 223,207,166,128,238,16
6,223,209
4030 DATA 166,128,238,166,223,21
1,166,128
4040 DATA 238,166,223,213,159,19
2
4050 DATA 57
5000 '*PLAY
5010 DATA 16,142,0,190,166,159,7
6,195,171
5020 DATA 159,76,198,169,159,76,
201,169
5030 DATA 159,76,204,183,255,32,
220,196
5040 DATA 211,207,221,196,220,19
9,211,209
5050 DATA 221,199,220,202,211,21
1,221,202
5060 DATA 220,205,211,213,221,20
5,49,162
5070 DATA 38,6,10,194,39,12,32,1
99
5080 DATA 166,128,32,0,32,0,32,0
5090 DATA 32,193
5100 DATA 57
6000 '*MAIN CONTROL
6010 DATA 23,255,117,141,145,129
,0,38
6020 DATA 4,79,31,139
6030 DATA 57,141,142,141,171,32,
240
6040 '* CLEAR MUSIC MEMORY
6050 DATA 142,79,34,79,167,128,1
40,111,255,38,249,57
6099 '*TOY FOR TWO LUTES
6100 DATA24,62,54,44,30,12,64,54
,44,30
6102 DATA12,62,54,44,30,12,58,52
,44,20
6104 DATA12,54,54,44,20,12,52,58
,44,20
6106 DATA12,58,52,44,20,12,54,54
,30,0
6108 DATA12,58,54,30,0,12,62,44,
30,0
6110 DATA12,64,44,30,0,24,68,38,
```

**FILEBOX/16 HOME FILING SYSTEM**

**ENTER THE INFORMATION AGE WITH FILEBOX/16. NOW AVAILABLE FOR THE TRS-80 16K, 32K, OR 64K COLOR COMPUTER WITH ONE DISK DRIVE.**

Create, change, update, delete, search, sort and list files you define. You don't have to be a programmer to use this system. Now includes corrections and features suggested in the review of **FILEBOX/16** in the March 1984 RAINBOW magazine.

Applications are virtually unlimited. Use for address lists, car repair records, household inventories, book and record collections, tax records, etc. You can use **FILEBOX/16** to print mailing labels. This use alone is worth your purchase price.

Each file you create can contain any number of records. Each record can contain up to 10 fields and 256 characters. Print records to screen or printer. Control report formats.

**FILEBOX/16 IS EASY TO USE.** This is NOT a system which requires that you learn special keys and operations. It is completely menu-driven. Has built-in lessons to supplement the 20 page loose-leaf User Guide, rated excellent in review.

**FILEBOX/16** is written in BASIC with a machine language sort. It uses efficient formatted direct access file logic contained in 8 programs you control from a menu.

**SPEÇIAL PRICE—Now only $29.90** **Diskette Only**
**was $39.90** **Plus $2.00 shipping**

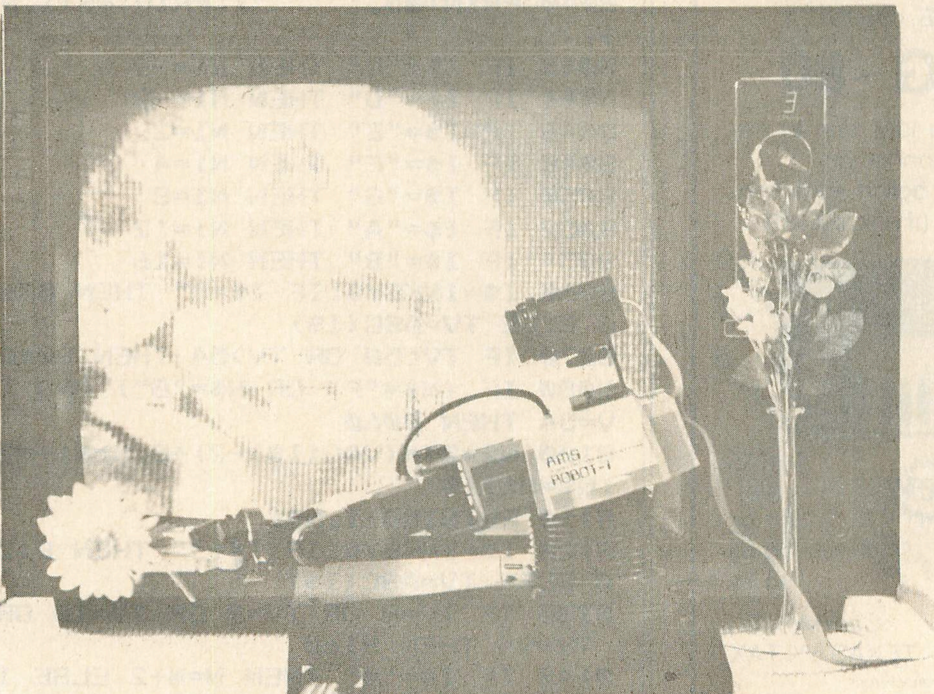
**Please specify 16K or 32K version.**
New Jersey residents please add $1.80 for sales tax.
Mail check or money order to:
CIRCLING STAR SOFTWARE CO.
P.O. Box 1218
Freehold, N.J. 07728
Phone: (201) 431-3660 after 6 p.m.
Call our BBS 10 pm - 7 am Eastern Time

RAINBOW CERTIFICATION SEAL

**FILEBOX/16** © 1983 by Luke Watson
TRS-80 is a trademark of the Tandy Corp.

```
0,0
6112 DATA12,72,48,40,0,12,72,52,
40,0
6114 DATA12,68,54,38,0,12,62,54,
38,0
6116 DATA12,64,58,34,0,12,58,52,
34,0
6118 DATA12,62,68,54,30,12,54,68
,54,30
6120 DATA12,58,68,52,44,12,52,64
,52,44
6122 DATA12,54,62,44,30,6,52,62,
44,30
6124 DATA6,48,62,44,30,6,44,54,0
,30
6126 DATA6,40,54,0,30,6,38,54,0,
30
6128 DATA 6,34,54,0,30,12,30,0,4
4,30
6130 DATA12,44,52,0,0,12,48,54,0
,0
6132 DATA12,52,58,0,0,12,62,54,3
8,0
6134 DATA6,58,54,38,0,6,62,54,38
,0
6136 DATA12,64,54,30,0,12,62,54,
30,0
6138 DATA12,58,58,44,28,6,68,58,
44,28
6140 DATA6,64,58,44,28,6,62,58,4
4,20
6142 DATA6,58,58,44,20,6,54,58,4
4,20
6144 DATA6,52,58,44,20,12,54,58,
38,24
6146 DATA6,52,58,38,24,6,54,58,3
8,24
6148 DATA6,58,48,16,0,6,54,48,16
,0
6150 DATA6,52,48,16,0,6,48,48,16
,0
6152 DATA12,52,52,38,14,6,48,52,
38,14
6154 DATA6,52,52,38,14,12,54,54,
38,6
6156 DATA12,52,52,38,6,12,48,48,
42,10
6158 DATA6,72,48,34,10,6,68,48,3
4,10
6160 DATA6,64,58,0,10,6,62,58,0,
10
6162 DATA6,58,54,0,10,6,54,54,0,
10
6164 DATA6,52,52,38,38,6,48,52,3
8,38
6166 DATA6,46,48,38,14,6,42,48,3
```

**Computer Servo Controlled Robot Arm**



**Robot-1**

Keyboard or Joystick Control

**Remembers Everything It Did & does it again**

**Typical System Includes:**

- Robot-1 & Cables
- 6 Channel Servo Controller
- Power Supply
- All Software with source code

**Modular Robotic Accessories:**

- Mobile Cart for Traveling Robot
- Radio Links between all Functions
- Robot-mounted MicronEye
- Ultrasonic Range Finder

Robot-1 Series

starting at $289.00
for the Color Computer
and 6809 SS50 Computers

Additional Systems Available

**Robot-1R for Radio Control Systems**

**Call or Write for Free Catalog**

**Analog Micro Systems**

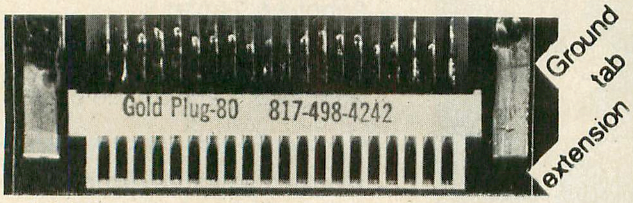
5660 Valmont Road · Boulder, Colorado 80301 · Tel: (303) 444-6809

```
8,14
6168 DATA6,46,52,38,14,6,48,52,3
8,14
6170 DATA6,52,52,38,14,6,46,52,3
8,14
6172 DATA1,46,52,0,0,12,48,48,38
,24
6174 DATA12,62,48,38,24,1,62,48,
38,0
6176 DATA12,66,48,38,24,12,70,48
,38,24
6178 DATA1,70,48,38,0,48,72,0,38
,24
6180 DATA0,0,0,0,0
6499 '*CONVERT NOTE TO STRING
6500 N3=2+INT((N-2)/24)
6510 N4=N-24*(N3-2)-1:N5=N4+1
6512 N1$=MID$(X$,N4,1)+RIGHT$(ST
R$(N3),1)+MID$(X$,N5,1)
6520 RETURN
6999 '* LENGTH CALCULATION
7000 I$=INKEY$:IF I$="" THEN 700
0 ELSE TV=ASC(I$)
7010 IF TV=8 OR TV=9 OR TV=10 OR
 TV=94 THEN 7160
7020 IF TV<48 OR TV>57 THEN 7000
7030 LL=96:I1$=I$:I2$="":I3$="":
PRINT@S,"   ";:PRINT@S+1,I1$;:N
=VAL(I$):IF N=0 THEN 7150
7040 I$=INKEY$:IF I$="" THEN 704
0 ELSE TV=ASC(I$)
7050 IF TV=8 OR TV=9 OR TV=10 OR
 TV=94 THEN 7130
7060 IF TV=46 THEN 7120
7070 IF TV<48 OR TV>57 THEN 7040
7080 I2$=I$:PRINT@S+1,I1$+I2$;:N
=10*N+VAL(I$)
7090 I$=INKEY$:IF I$="" THEN 709
0 ELSE TV=ASC(I$)
7100 IF TV=8 OR TV=9 OR TV=10 OR
 TV=94 THEN 7130
7110 IF TV<>46 THEN 7090
7120 I3$=".":LL=144
7130 IF N<1 OR N>96 THEN N=0:GOT
O 7150
7140 N=LL/N
7150 POKEM,N:PRINT@S+1,I1$+I2$+I
3$;
7160 PRINT@S,P$;:IF Y=5 THEN PRI
NT@S+4,B$;
7180 RETURN
7999 '* CALCULATE NOTES
8000 I$=INKEY$:IF I$="" THEN 800
0 ELSE TV=ASC(I$)
8010 IF TV=8 OR TV=9 OR TV=10 OR
 TV=94 THEN 8180
8020 N$=I$:IF I$="0" THEN N=0:PR
INT@S,"   ";:GOTO 8160
8030 IF TV<65 OR TV>71 THEN 8000
8040 PRINT@S,"    ";:PRINT@S+1,N
$;
8042 IF I$="C" THEN N1=-6
8044 IF I$="D" THEN N1=-2
8046 IF I$="E" THEN N1=2
8048 IF I$="F" THEN N1=4
8050 IF I$="G" THEN N1=8
8052 IF I$="A" THEN N1=12
8054 IF I$="B" THEN N1=16
8060 I$=INKEY$:IF I$="" THEN 806
0 ELSE TV=ASC(I$)
8070 IF TV<50 OR TV>54 THEN 8060
8080 IF (N$="F" OR N$="G") AND T
V=54 THEN 8060
8100 N2=24*(VAL(I$)-2)+8:N=N1+N2
:N$=N$+I$
8110 PRINT@S+1,N$;
8120 I$=INKEY$:IF I$="" THEN 812
0 ELSE TV=ASC(I$)
8130 IF TV=8 OR TV=9 OR TV=10 OR
 TV=94 THEN 8160
8140 IF I$="#" THEN N=N+2 ELSE I
F I$="-" THEN N=N-2 ELSE 8120
8150 N$=N$+I$
8160 PRINT@S,P$;:PRINT@S+1,N$;:I
F Y=5 THEN PRINT@S+4,B$;
8170 POKE M,N
```

TRS-80+ MOD I, III, COCO, TI99/4a
TIMEX 1000, OSBORNE, others

GOLD PLUG - 80

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors. **GOLD PLUG 80** solders to the board edge connector. Use your existing cables. (if gold plated)



| | |
|---|---|
| **COCO** Disk Module (2) | $16.95 |
| Ground tab extensions | INCL |
| Disk Drives (all R.S.) | $7.95 |
| Gold Disk Cable 2 Drive | 29.95 |
| Four Drive Cable | 39.95 |

new SPECIAL PRICE

USA shipping $1.45 Can/Mex $4.
Foreign $7 Don't wait any longer TEXAS 5% TAX

Available at your favorite dealer or order direct from

E.A.P. CO.
P.O. BOX 14
KELLER, TEXAS 76248
(817) 498-4242 MC/VISA

+ trademark Tandy Corp

```
8180 RETURN
8999 '*ALTERNATE MENUS
9000 MF=-1*MF
9010 IFMF=-1THEN9020ELSE9030
9020 PRINT@417," (P)LAY ";:PRINT
@428," (S)AVE ";:PRINT@439," (L)
OAD ";:PRINT@449," (J)UMP ";:PRI
NT@460,"(I)NSERT";:PRINT@471,"(R
)EMOVE";:GOTO9040
9030 PRINT@417,"(T)EMPO ";:PRINT
@428," (K)OPY ";:PRINT@439," (M)
OVE ";:PRINT@449,"          ";:PRI
NT@460,"          ";:PRINT@471," (
Z)ERO ";
9040 RETURN
9099 '*SET TEMPO
9100 PRINT@489," TEMPO = ?     ";
:TC=0
9105 T9$=INKEY$
9110 T9$=INKEY$:IFT9$=""THEN9110
9115 T6=ASC(T9$):IF T6<48 OR T6>
57 THEN 9110
9117 PLAY P7$
9120 IFTC=0THENTC=1:T9=100*VAL(T
9$):PRINT@498,T9$;:GOTO9110
9130 IFTC=1THENTC=2:T9=T9+10*VAL
(T9$):PRINT@499,T9$;:GOTO9110
9140 IFTC=2THENTC=0:T9=T9+VAL(T9
$):PRINT@500,T9$;
9150 T9=INT(TT/T9):IFT9<18THENT9
=18ELSEIFT9>600THENT9=600
9155 T8=INT(T9/256):T7=T9-256*T8
9160 POKEA8,T8:POKEA8+1,T7
9170 T9=TT/T9:PRINT@489," TEMPO
=      ";:PRINT@497,USING"###";T
9;:PRINT@488,B$;:PRINT@503,B$+B$
;:GOTO100
9199 '* COPY
9200 PRINT@44,"  COPY (REPEAT)
";:PRINT@10,R$"START COLUMN
  "R$;:PRINT@23,;:INPUTCS:CS=A5+
5*CS-5:PRINT@31,B$;
9210 PRINT@10,R$"END COLUMN
    "R$;:PRINT@23,;:INPUTCE:CE=A
5+5*CE-1:PRINT@31,B$;
9220 PRINT@10,R$"DEST. COLUMN
    "R$;:PRINT@23,;:INPUTCT:CT=A
5+5*CT-5:PRINT@31,B$;
9225 TA=CT
9230 FOR I=CS TO CE
9235 CV=PEEK(I):POKE TA,CV:TA=TA
+1
9240 NEXT I
9250 S=139:X=1:Y=1:M=TA-5:Z=(M-A
5+5)/5:M1=M+4:IFM1>J THENJ=M1
9260 PRINT@10,B$+B$;:PRINT@12,"
* ENTER MUSIC * ";B$+B$+B$;:PRIN
T@44,"   (SPACE BAR)    ";:GOTO70
9299 '*MOVE PLAY START LOCATION
9300 PRINT@44,"BEGIN PLAY COLUMN
";:PRINT@12,R$" SELECT#       "R
$;:PRINT@21,;:INPUTZT:PRINT@29,B
$+B$+B$;:ZT=INT(ZT):IFZT<1ORZT>2
300THEN9300ELSEZT=128+5*(ZT-1)
9310 ZU=INT(ZT/4096):ZV=ZT-4096*
ZU:ZW=INT(ZV/256):ZL=ZV-256*ZW:Z
U=16*ZU+ZW
9320 POKEA9,ZU:POKEA9+1,ZL:CLS2:
PRINT@230," MUSIC PERFORMANCE ";
:POKE65494,0:C=USR0(0):GOTO60
9350 PRINT@12," * ENTER MUSIC *
";B$+B$+B$;:PRINT@44,"   (SPACE
BAR)    ";:GOTO 70
9399 '*CLEAR MUSIC MEMORY
9400 CLS:PRINT@96,"**** YOU ARE
ABOUT TO CLEAR ****";:PRINT@128,
"**** THE MUSIC DATA MEMORY ****
";
9405 PRINT@224,"        IS THAT WHA
T YOU WANT              TO DO (Y/N)
 ";
9410 INPUT"";I$:IF I$="Y" THEN C
=USR1(0)
9420 J=A5:GOTO 60
10000 PMODE0:PCLEAR1:GOTO 14
10001 END
```

# Quality Christian Software

## MONEY BACK GUARANTEE

If for any reason you are not fully satisfied with any program you purchase from Quality Christian Software just return the original program (Cassette or Diskette) and we will refund the purchase price of the program.

## ★ ★ ★ ★ ★ 4 NEW PROGRAMS ★ ★ ★ ★ ★

**PILGRIM'S PROGRESS:** An interactive adaptation of Pilgrim's Progress in the form of an adventure game. Your progress is directed away from the city of destruction and towards the Celestial City. Important Biblical Doctrines are grasped as the player proceeds. Requires 16k E.C.B. — $17.99 Cassette.

**CHURCH TIME:** A light hearted non-theological adventure for the whole family. You're almost late for church and to top it off you forgot your Bible. Rushing back into your house you find that the sticky front door has bolted behind you. The object is to find your Bible and get outside so that you won't be late for church. 32k E.C.B.—$10.99 Cassette.

**BIBLE REFERENCE PROGRAM:** Topographical Bible Reference Program covering 27 Topics with 60 Biblical References. 16k E.C.B. not required—$10.99 Cassette.

**3-GAME PACK #3:** Reversed Sword Drill game #2, "Who Did That" Game #2 & "Who Said That" Bible Quote game #2.—16k E.C.B.—$10.99 Cassette.

**JUDE:** A full text commentary and reference study on the Epistle of St. Jude. See the review in the December 1983 Issue of RAINBOW. Page 286. Requires 32k E.C.B. Cassette $13.99 Disk $16.99

**3-GAME PACK #1:** Books of the Bible Game, Bible Character Word Scramble game & "Who Said That" Bible quote game. Requires 16k E.C.B. — Cassette $10.99

**3-GAME PACK #2:** Reversed Sword Drill game, "Who Did That" game & Bible Places Word Scramble game. Req. 16k E.C.B.—Cassette Version $10.99.

VISA

Please Add $2.00
for freight
C.O.D.'s add $4.00
Overseas add $6.00

**QCS**
P. O. Box 1899
Duncan, OK 73534
**405/255-5696**

24 Hour
Phone
Service

RAINBOW CERTIFICATION SEAL

MasterCard

# PRICKLY-PEAR SOFTWARE

## QUALITY PROGRAMS FOR YOUR COCO & TDP-100

**PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.**

# COLOR DISK TRIVIA

## WITH DEVELOPMENT SYSTEM FOR EDUCATIONAL USE

Here it is! The first new program offered by the author of the famed **VIKING!** in nearly two years, and worth the wait.

### Color Disk Trivia

is simply a very good, and very fun to play game. It has everything going for it: The challenge of trivia, ease of use, a good social game encouraging conversation, and you may even learn something! The development system (included) even lets you easily create your own custom question disks.

The play of the game is easy to understand, because the computer does all the work for you. It even looks up and presents the proper question!

On each question disk there are five categories, and there are an amazing 1100 questions on each disk. No, that's not a misprint, we said 1100 questions per question disk! Yes, that is a pretty full disk. Because the questions are stored on the disk, instead of in memory, you can play **COLOR DISK TRIVIA** on any size Color Computer system with one disk drive — 16K, 32K, or 64K.

There are already five question disks available, and you get the GENERAL disk when you purchase the game. That's correct, there are already FIVE question disks with a total of 5500 questions available for shipment RIGHT NOW, with more on the way shortly.

All question disks have five categories and 1100 questions. The disks available now are:

**GENERAL:** (Included with the game) The categories for this disk are history, the written word, movies & television, science & the world, and sports.

**ENTERTAINMENT:** These categories are movies, the stage, television, music, and literature.

**BIBLE:** 1100 questions in five categories on the Old and New Testaments.

**SPORTS:** This disk will challenge even the very knowledgeable sports fan. All major sports (and some minor ones) are represented.

**CHILDREN:** No, this isn't questions ABOUT children, it's questions FOR children. 1100 fun questions just for the younger set.

The game of **COLOR DISK TRIVIA** can be played by from 1 to 4 people (or teams), and you set the length of the game at the start when you decide how many questions must be answered in each category to win. The computer chooses the categories randomly, though sometimes it will let you choose the category for yourself (or let your opponents choose for you). Because of this category selection by the computer, a single category can often hold you up while one of your opponents slips by to win. The outcome is always in doubt, and no player is ever eliminated.

Trivia lovers will enjoy the fact that you can play without other people if you desire, because the computer will provide plenty of challenge. We want to emphasize that this is, first and foremost, a fun game.

---

Your Personal check is welcome - no delay. Include $1.50 shipping for each program ordered. (Shipping free on $50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

### The Development System

Naturally, in order for our programmers to type in thousands of questions easily and accurately, a good development program to create the question disks had to be written, and we include this program with the game at no additional charge!

The program is all menu-driven and very user-friendly. That means that no knowledge of programming is needed to use it. If you can turn on your computer and type, you're all set! Now sit back and imagine the educational possibilities.

Yes, our question disks have 1100 questions, but the game program will handle question disks having any number of questions from 5 up to a full disk of 1100, so a teacher can type in 50 or 100 questions and answers (the questions are multiple choice), and then the students can play the "game" and have a great time, while accidently picking up the lesson. Let the natural spirit of competition fuel the learning process.

The development program is very easy to use, and gives you options to add questions, change or delete a question, and print the questions and answers on the screen (or a printer, if you have one). You can develop a question disk and easily add questions to it any time you wish.

This program finally gives parents and teachers the opportunity to easily create a custom learning program for any level student, and if we keep it a secret, no-one need know it's more than a game.

**TECHNICAL INFORMATION: COLOR DISK TRIVIA** is a mixture of Machine Language and BASIC. It uses Fielded Direct Access Disk Files. **COLOR DISK TRIVIA** requires 16K and at least one disk drive.

**ORDERING INFORMATION:**

**COLOR DISK TRIVIA GAME** with **QUESTION DEVELOPMENT SYSTEM** and **GENERAL** question disk containing 1100 QUESTIONS: **$29.95**

**ADDITIONAL QUESTION DISKS:**

**THE BIBLE:** 1100 questions on the Bible. **$19.95**

**ENTERTAINMENT:** 1100 questions on movies, TV, stage, music, and literature. **$19.95**

**SPORTS:** 1100 questions for the sports fan. **$19.95**

**CHILDREN:** 1100 questions for the younger set. **$19.95**

**FOR A LIMITED TIME,** buy the game for **$29.95** and select an additional disk of your choice for ½ price! That's a **$49.90 value for just $39.95.** You save $10, and we will pay the shipping.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P. O. Box 11932, Edmonton, Alberta T5J-3L1 (403) 421-8003

**Stocked by Quality Dealers, or**

Send Order To: **PRICKLY-PEAR SOFTWARE**
8532 E. 24th Street
Tucson, Arizona 85710
(602) 886-1505

# A Dandy Doodler

### By Eugene Vasconi

Here is a small program which might be of interest to those of you who like to play with the graphics capabilities of your CoCo.

It's called *Computer Doodler* and uses the animation abilities of the computer to provide a moving sketch pad. The user can create a variety of drawings and designs using the joystick which controls a dot and . . . well, just *CLOAD* and see for your yourself.

The program executes an automatic *PCLEAR 8* and requires 16K Extended Color BASIC.

END ....... 41

**The Listing:**

```
1 PMODE1,1:GOTO28
2 CLS:PRINT:PRINT:PRINT"COMPUTER
-DOODLER":PRINT:PRINT"USE THE RI
GHT JOYSTICK TO      CONTROL YO
UR DOODLE-DOT AND GO  FOR SOME S
PARKLING EFFECTS."
3 PRINT:PRINT"TO MOVE THE DOT WI
THOUT MAKING  A TRAIL, PRESS AND
 HOLD THE      FIRE BUTTON.  TO C
LEAR YOUR       DRAWING, PRESS <CL
EAR>."
4 PRINT:PRINT"PRESS [ENTER] TO S
TART"
5 A$=INKEY$
6 IF A$<>CHR$(13) THEN5
7 A=125:B=95
8 FORY=1TO8STEP2:PMODE1,Y:PCLS(3
):NEXTY
9 FORX=1TO8STEP2
10 PMODE1,X
11 SCREEN1,1
12 AA=JOYSTK(0):BB=JOYSTK(1)
13 IFAA<10THEN A=A-2
14 IFAA>50THEN A=A+2
15 IFBB<10THEN B=B-2
16 IFBB>50THEN B=B+2
17 IFA<1THEN A=1
18 IFA>255THEN A=255
19 IFB<1THEN B=1
20 IFB>195THEN B=195
21 P=PEEK(65280)
22 IF P=126OR P=254THEN GOTO24
23 PSET(A,B,5):GOTO25
24 PSET(A,B,4):FORPP=1TO10:NEXT:
PSET(A,B,3)
25 NEXTX
26 A$=INKEY$:IF A$=CHR$(12)THEN
GOTO8
27 GOTO9
28 PCLEAR8
29 GOTO2
```

*(Eugene Vasconi, a free-lance television producer, holds a M.A. in telecommunications. A self-taught CoCoer for two years, he sees the computer as the art form of the future in both graphics and music. His activities in Dallas involve television production and aviation.)*

RAINBOW WISHING WELL

32K
ECB

*And now,* three *wishes from the well*

# A CoCo Triple Header

**By Fred B. Scerbo**
**RAINBOW Contributing Editor**

*Editor's Note: If you have an idea for a program you would like to see printed in* THE RAINBOW, *submit it to "Wishing Well," c/o* THE RAINBOW. *We don't promise that any given wish will be granted, but with a little luck, you might find a program listed that will grant your wish. Please remember, all programs listed in* THE RAINBOW *from your wishes are for your use but remain the property of the author. Keep those ideas coming in.*

Here we are just a few days after the finish of the New Brunswick RAINBOWfest and I am still putting the finishing touches on our latest "Wishing Well." Let me take a brief moment to thank all of you who came to my presentation. It is always exciting to get feedback from fellow CoCo owners. Your comments and encouragement were indeed exciting, not to mention all the wishes which people were able to give to me. At the presentation, I commented that I would really like to be able to grant every wish, but that will not be possible. Maybe in time, the "Wishing Well" will become the "Dear Abby" of the Color Computer world!

This month I am going to grant three wishes, but before I do that, let me just make one suggestion regarding your wishes. Please make your requests as specific as possible! One person requested *farming* programs, and for the life of me, I have no idea what he is talking about (a program to file cattle?). Also, some requests are very similar, so the end result in these programs may be a combination of requests. In cases such as this, it will not always be possible to identify the person(s) who made the wish. I know you would all like to see your name in print, but I hope you will be happy to see your wish granted instead.

Now let's get to granting this month's wishes.

*(Fred Scerbo is a special needs instructor for the North Adams Public Schools. He holds a master's in education and published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.)*

### Baseball Fever Part 1

As you will recall, last month we had the first CoCo Rockfest which presented some elaborate rock'n'roll graphics (which your friends with other brand computers cannot easily do). Judging from the reaction I received at RAINBOWfest, as well as from other CoCo owners who got a sneak preview, such graphics experiments are very popular. (Rockfest II is already in the works.) As I mentioned last time also, these listings make great graphic rewards for educational programs such as the screen quiz programs from the previous month.

No sooner had I shown the rock symbols to some friends than I received suggestions to do the same with national sports teams. I figured this had to be easier than some of the rock art, such as the ZZ Top section of Rockfest. (Was I ever wrong!) Therefore, since we were approaching the start of the baseball season, I went right to work trying to get these symbols done in time for the next deadline.

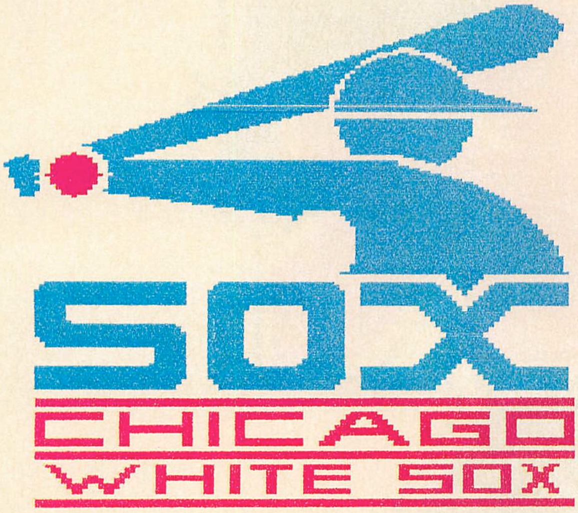
The result you will find in Listing 1 is titled *Fever 1* and is a menu-driven graphics display of all the symbols for the American Baseball League. (Yes, I am working on completing the National League. In fact, I probably should have done them first, since there are fewer of them.)

You will notice that the top of the "Wishing Well's" title page indicates 32K ECB (Extended Color BASIC). While most of my programs are written on a 32K system, I always like to write these programs in segments which can be partially entered on a 16K ECB machine. If there is a particular team which you would like to draw, you can go just to that section of the program based on the *REM(')* statements. If you choose to do this, you must also take the following steps.

First, include these lines:

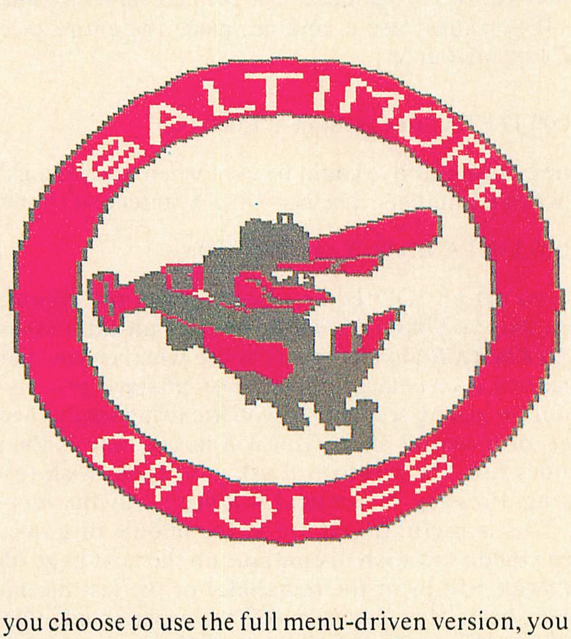
```
10 CLEAR500
20 R=2:B=3:R$="C2"
30 B$="C3":OF=0
```

These lines will insure that you have the proper strings and variables for the color graphics. Using this method, you may have to press the Reset button to control the occurrence of red or blue in the graphics. (Ever hear of the Boston Blue Sox?)



Next, the last line of each section should always go back to itself (i.e., *100 GOTO100*). This will hold the graphics on the screen for us in an endless loop.

Using *Fever 1* in this way can offer some good little short listings for young CoCo owners to type in. (Most sections are 10 to 12 lines each.) I have found that kids of all ages enjoy typing in short programs which give sharp graphics results. It serves to stimulate them to create their own graphics programs.



If you choose to use the full menu-driven version, you will not need to press the Reset button. The title card, which says BASEBALL FEVER 84, will be displayed with the letters 'A' and 'B' in either red or blue. Simply press the red colored letter ('A' or 'B') to set the colors and proceed to the menu.

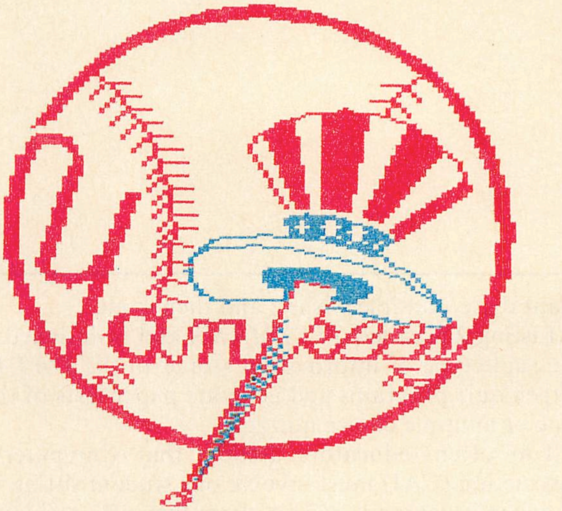
From the menu, you can call any of the graphics to the screen. If you want to dump the results to a line printer, use one of the graphics screen dump programs found in THE RAINBOW or its ads. The results can look very good on paper.

For those who are interested, most of these graphics can take about two to three hours each to write. A little secret which I shared with people at RAINBOWfest was the use of the *INKEY$* command to speed up my graphics writing. To do this, when you are writing a graphics display, make this line your last line during writing:

```
1000 IF INKEY$=""THEN1000 ELSE EDIT50
```

The line number following *EDIT* can be whatever line you are currently writing in. Thus, when you press any key, you will be in the *EDIT* mode for whatever line you are writing. This comes in very handy when minor changes must be made in the position of *DRAW* statements, which can be very long at times. Try this approach and you will save a great deal of time. (You will have to change the *EDIT* line number each time you proceed to a new line.)

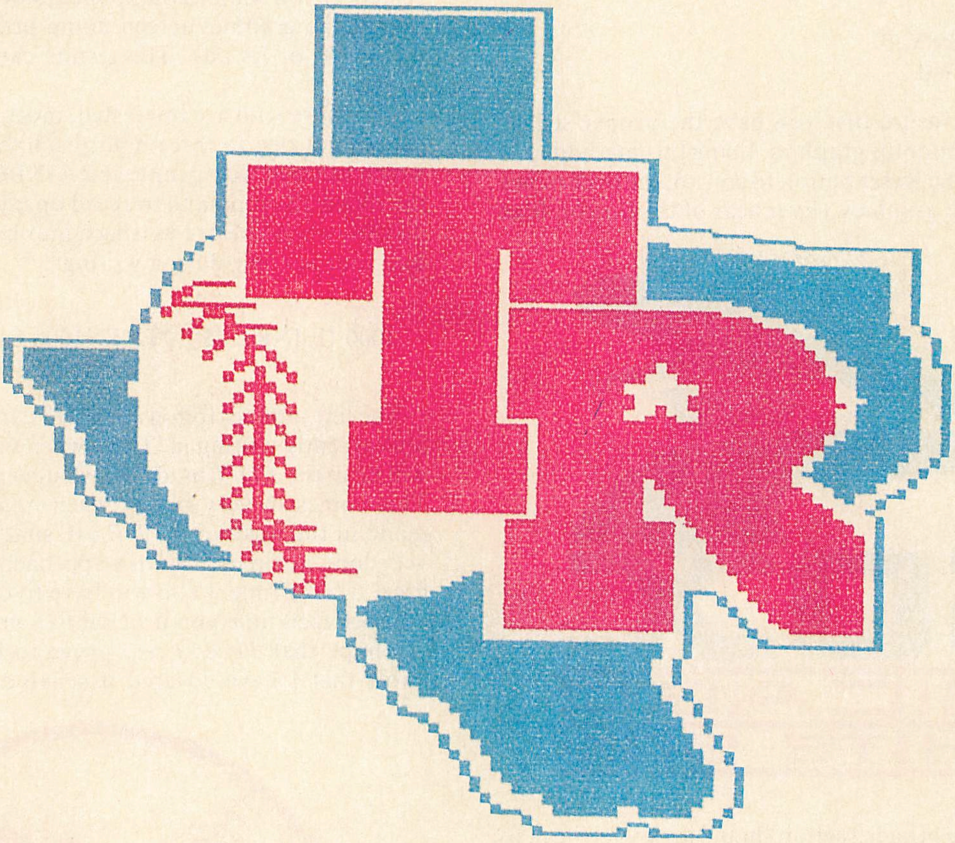
I hope that *Fever 1* will prove to be enjoyable to you. (Now that I have covered baseball and basketball in the "Wishing Well," the members of my high school wrestling team want to know when I am going to do a wrestling program! Any ideas out there? This could be the toughest wish yet!)



**Wishes 2 And 3**

Now that we have handled the fun wishes, let's get down to some serious educational business. I received many fine comments on the screen quiz programs that appeared two months ago. It seems that some schools have already started putting them to serious and steady use. (Some have even translated them to other systems. More on that later.)

Several requests I have received by mail, and in person at RAINBOWfest have asked for an extension of these programs which would allow school systems to use their CoCos to save a bank of tests. The two programs listed here will



grant these multiple wishes, and then some.

Listing 2 is called *TESTMAKR* and is designed to take the same type of information stored in the *DATA* of the screen quiz programs and generate paper tests of the same type of multiple choice quizzes.

Too often, educators assume that Computer Aided Instruction (CAI) must involve one student sitting in front of one microcomputer. Too often, they will ignore the ability of the computer to create endless stacks of random paper assignments without error. Did you ever try to type a quiz on a ditto master, take it out to make an erasure, and then try to line it up in the typewriter again? It is almost impossible to do! Therefore, why not let the computer and line printer do the work for you?

The beauty of *TESTMAKR* is that every time you run it, it will create a different printed test on the same material, much the same way the screen quiz program would on the screen. You even have the option of reversing the *DATA* to further change the format of the printed material.

Once you have entered *TESTMAKR*, or loaded it from disk or tape, type:

```
DEL 1000-5000
```

so as to remove my *DATA* from the listing. You may enter your own *DATA* starting in line 1000, and your information should be designed in two matching sets such as question and answer, term and definition, or blank sentence and fill-in word. Be careful not to use commas in your punctuation. If you must use a comma, place the entire piece of *DATA* inside quotes.

```
1000 DATA "one million","1,000,000"
```

The example above could be used when comparing digits and written numbers. The last *DATA* statement should be:

```
5000 DATA END, Your Test Title
```

If you get an ?OD Error when you run the program, it means that you have left out or inserted an extra comma.

*TESTMAKR* also lets you choose whether you want to use standard or enlarged print. The enlarged print is very helpful for young students. If you are using single sheets of paper, or a master sheet, you will notice that as the page becomes full, the screen will ask you if you wish to keep printing. Pressing 'N' for next will print only the very next line. This is useful if you are in the middle of a question which you do not wish to continue on the next page. Pressing ENTER will print the remainder of the test of another page or sheet. This feature makes the program adaptable to almost any line printer.

**Now For Listing 3**

This listing is called *QUIZMAKR* and differs from *TESTMAKR* in that it creates a matching quiz on paper in three different formats. You can create a matching quiz, a fill-in-the-term quiz, or a fill-in-the-definition quiz, all from the same *DATA*. The program is menu-driven, and even allows you to print a sheet of terms and definitions to study.

There are a few restrictions, however.

First, your term must be no more than 22 characters long. Your definition can be of almost any length, as the program will prevent wrap-around by formatting the information in neat columns.

Second, you should limit the quiz to fewer than 20 terms and definitions. As a teacher, I can assure you that you do not want a matching quiz that goes over one page. You want to have students match material on *one page* in front of them, not over several pages.

Third, you may only use one print size: standard. This is again so our material fits on one page.

*DATA* is entered in the same fashion as the other three programs discussed above. For the listing I have given you here, I borrowed some science terms from my fellow Resource Room Instructor, Donna Baker, who just got her husband a CoCo for Christmas. Now she can use the CoCo at home for some of her school work, too!

The great advantage to both *QUIZMAKR* and *TESTMAKR* is that you can allow some sheets to be used for classroom work, another different sorted set for homework, and another for the final test or quiz. In our school system, there is a strong encouragement to use standard tests for final exams, yet have different versions of the same test for different periods of the day. These programs make this task easy. Period one students can no longer tip off students taking a test during the fifth period.

Finally, these programs can also be used by parents to help students study at home. Just follow the same steps listed above and your child can drill important terms or facts in endless variations.

What if you are a teacher who has a CoCo at home, but are stuck with an Apple or PET in school?

Let *Color Scripsit* translate each listing for you!

Save each program in ASCII and load them into *Color Scripsit* (disk or tape). Go into EDIT TEXT mode (2), go to the start of text, and press BREAK '7', which is the find and change routine. Use the find and change section to translate from CoCo to Apple or PET. For example, *CLS* on CoCo is the same as HOME on Apple or ?CHR$(147); on PET or Commodore. Therefore,

FIND: CLS

then

CHANGE: HOME

In a future issue, I'll give more detailed steps on translating entire programs (someone already made this wish). Remember, all you can get is a paper listing translated to type by hand. You cannot just load into an Apple or PET. This will at least make the job a little easier.

**Conclusion**

We have covered a great deal of territory this month, so I hope you get some use out of some of these programs. Next month, we'll continue granting more of these wishes.

★B-5 Software★

**B-5** believes your Color Computer is a unique teaching tool. Our programs have been created by teaching professionals to give your children the help they need. B5 incorporates fun with basic learning skills.

★★★★★★★★★★★★★★★★★★★★★★★★★★★★★

**EDUCATIONAL PROGRAMS**

★★★★★★★★★★★★★★★★★★★★★★★★★★★★★

**4★CLOCK**
Grades 1-4
*16K Cass. $24.95; 32K Disk $26.95*

**4★BORROW**
Grades 2-4
*16K Cass. $19.95; 32K Disk $21.95*

**4★MONEY**
Grades 2-4
*16K Cass. $19.95; 16K Disk $21.95*

**4★CARRY**
Grades 2-4
*16K Cass. $19.95; 32K Disk $21.95*

**4★MATHFACT**
Grades 1-5
*16K Cass. $16.95; 32K Disk $18.95*

**SKIP COUNTING**
Grades 1-4
*16K Cass. $16.95; 32K Disk $18.95*

**QUESTION**
Grades 1-8
*16K Cass. $19.95; 32K Disk $21.95*

**HANGWORD & SCRAMBLE**
Grades 1-8
*16K Cass. $14.95; 32K Disk $16.95*

**SPELLING**
Grades 1-8
*16K Cass. $16.95; 32K Disk $18.95*

**KEYBOARD**
Grades 1-8 *16K Cass. $19.95; 32K Cass. $24.95; 32K Disk $26.95*

**ABC's**
Grades K-1
*16K Cass. $9.95; 16K Disk $11.95*

*All B-5 programs require Extended Basic.*

**BROCHURES UPON REQUEST**
**Ask your Dealer for a Demonstration today!**

If unavailable locally, send check or money order to:

★★★★★★★★★★★★★★★★★★★★★★★★★★★★★

**DATA TAPE LISTINGS**

★★★★★★★★★★★★★★★★★★★★★★★★★★★★★

Data Tapes may be used with other B5 programs.
*They cannot be used alone.*

***Use With Keyboard Program***
**KEYBOARD PHONIC DRILL** - letter, word and sentence finger drills using common vowel and consonant combinations. *$8.95*

***Use With Keyboard, Spelling or Hangword Programs***
**DOLCH WORDS** - 273 words used most often in beginning readers. *$8.95*

**GRADE LEVEL SPELLING** - over 300 words on each tape; each lesson follows a phonic rule. Available for grades 2, 3, 4, 5, and 6. *$8.95 per grade level.*

**SPACE WORDS** - over 300 words to challenge and motivate the superior speller. Grades 4-8. *$8.95*

**ADULT WORDS** - most often misspelled words. Highly challenging. *$8.95*

***Use With Questions Program***
**NOUNS AND VERBS** - 4 lessons on nouns and 4 on verbs. Grades 3-5. *$8.95*

**READING COMPREHENSION** - lessons build from simple to complex. Grades 2-4.

Main Idea ........................ *$10.95*
Sequencing ........................ *$10.95*
Fact & Opinion ........................ *$10.95*
Cause & Effect ........................ *$10.95*
Complete Series of 4 ................ *$39.95*

**B5 Software**
**1024 Bainbridge Place**
**Columbus, Ohio 43228**
**(614) 276-2752**

**Free Shipping in U.S.A. & Canada**
(Ohio residents add 5.5% Sales Tax)

|  |  |
|---|---|
| 40 | 167 |
| 76 | 0 |
| 100 | 21 |
| 126 | 35 |
| 146 | 199 |
| 174 | 249 |
| 196 | 90 |
| 220 | 38 |
| 236 | 189 |
| 254 | 63 |
| 276 | 111 |
| 308 | 87 |
| 326 | 30 |
| 352 | 51 |
| 376 | 173 |
| 398 | 206 |
| 412 | 101 |
| 430 | 229 |
| 438 | 224 |
| 454 | 149 |
| 464 | 23 |
| 478 | 121 |
| 494 | 32 |
| 504 | 250 |
| 518 | 241 |
| 528 | 111 |
| END | 225 |

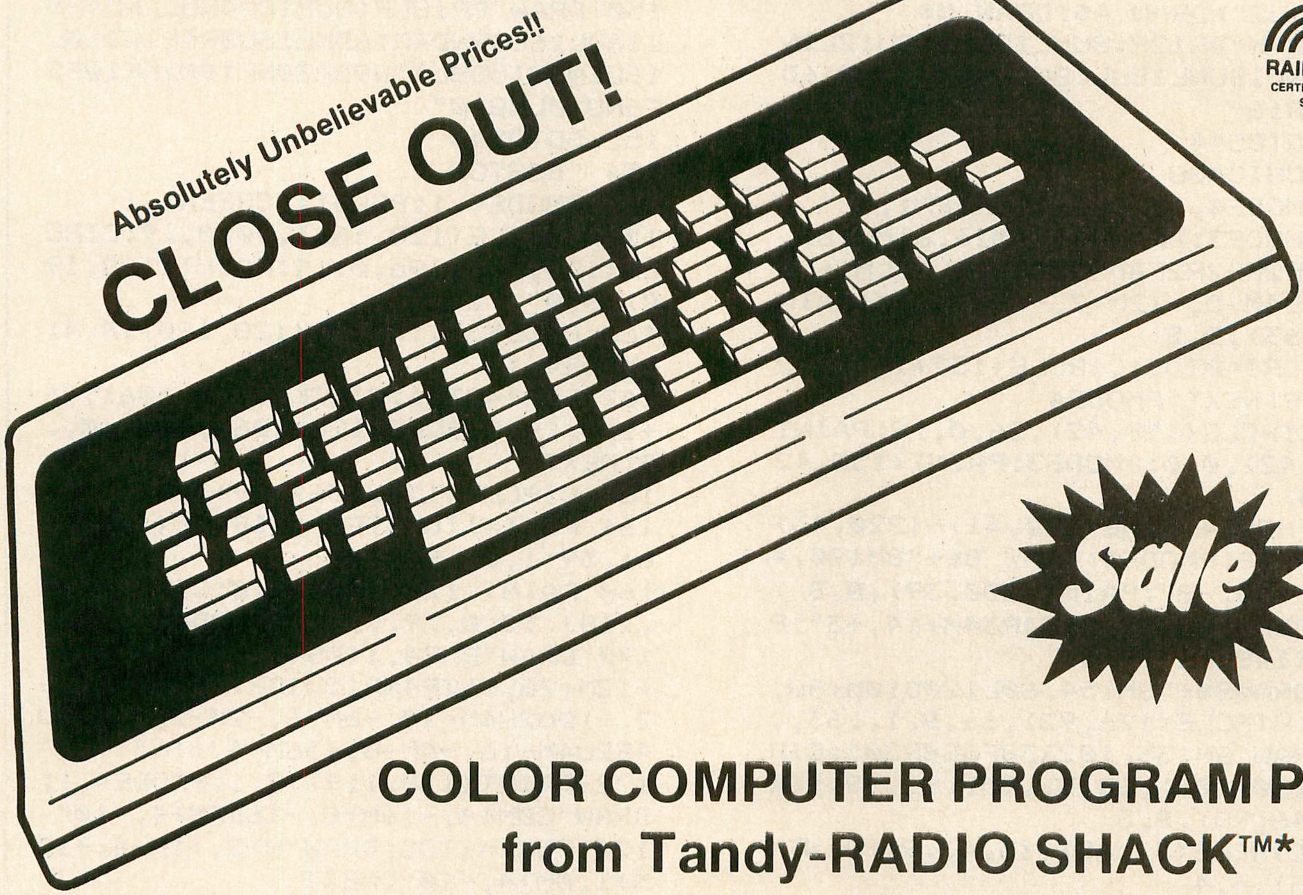
Listing 1:

```
12 ' BASEBALL FEVER '84 PT. 1
14 ' BY FRED B.SCERBO (C)1984
20 PMODE4,1:PCLS1:SCREEN1,1:PMOD
E3
22 FORI=20TO24:I$=STR$(I):DRAW"S
16BM"+I$+",102C3U12R6F2D2G2NL6F2
D2G2NL6BR8C2M+6,-12M+3,+6NL6M+3,
+6BR8C1NH2R4E2U2H2L4H2U2E2R4NF2B
R10NR6D6NR6D6NR6":NEXT
24 FORI=84TO88:I$=STR$(I):DRAW"B
M"+I$+",48C3U12R6F2D2G2NL6F2D2G2
L6C1BD16D8NR8BD2D8R8":NEXT
26 DRAW"S4BE26BU28U6NR6U6R6BR8NR
6D6NR6D6R6BR6BR2BU12M+4,+12M+4,-
12BR6NR6D6NR6D6R6BR8U12R4F2D2G2N
L4F2D4":FORY=1TO4:FORI=150TO170S
TEP20:CIRCLE(180+Y,I),20,2,.6:NE
XTI,Y
28 DRAW"BM236,140C2D20L20U20LD21
R22U21RD40LU19":CLEAR260:RUN30
30 X$=INKEY$:IFX$="A"THEN32ELSEI
FX$="B"THEN34ELSE30
32 R=2:B=3:R$="C2":B$="C3":OF=0:
GOTO36
34 R=3:B=2:R$="C3":B$="C2":OF=-1
36 CLS:PRINT" ";STRING$(30,"*")
38 PRINTTAB(5)"A) CLEVELAND INDI
ANS"
40 PRINTTAB(5)"B) CHICAGO WHITE
SOX"
42 PRINTTAB(5)"C) BOSTON RED SOX
"
44 PRINTTAB(5)"D) TORONTO BLUE J
AYS"
46 PRINTTAB(5)"E) CALIFORNIA ANG
ELS"
48 PRINTTAB(5)"F) NEW YORK YANKE
ES"
50 PRINTTAB(5)"G) MILWAUKEE BREW
ERS"
52 PRINTTAB(5)"H) TEXAS RANGERS"
54 PRINTTAB(5)"I) OAKLAND ATHLET
ICS"
56 PRINTTAB(5)"J) DETROIT TIGERS
"
58 PRINTTAB(5)"K) KANSAS CITY RO
YALS"
60 PRINTTAB(5)"L) SEATTLE MARINE
RS"
62 PRINTTAB(5)"M) BALTIMORE ORIO
LES"
64 PRINTTAB(5)"N) MINNESOTA TWIN
S"
66 PRINT" ";STRING$(30,"*");
68 FORI=1TO481STEP32:PRINT@I,"*"
;:PRINT@I+29,"*";:NEXT
70 X$=INKEY$:IFX$=""THEN70
72 X=ASC(X$)-64:IFX<=0THEN70ELSE
IFX>14THEN70
74  ON X GOTO78,116,156,218,262,
280,340,364,396,420,446,464,486,
510
76 'CLEVELAND
78 PMODE4,1:PCLS1:SCREEN1,1:PMOD
E3:CIRCLE(118,82),36,1,.5,.35,.6
80 DRAW"C1BM100,96M+10,+12M+6,+3
M+10,+2R12M+30,-18R2"
82 CIRCLE(166,84),16,1,.8,.85,.2
5:CIRCLE(174,66),10,1,1.3,.6,.2
84 DRAW"BM166,60M-14,-16L3M+2,+6
M-6,-14L2M-8,+16M+4,-8U2L24M+3,+
9M-5,-15L4M-16,+36"
86 DRAW"BM116,66U4M-4,-8L6M-7,+1
6R9L3M+3,-9R4D4R2D2M-8,+6D2L2D6R
2D2R2D2F2R6M+14,-5NH4M+24,+6F2D6
M-23,+9M-16,-2M-22,-17U3E2M+8,+2
BR17BD4M+19,+3M+16,-1BL16C4U10"
88 PAINT(110,64),1,1
90 DRAW"BU8BL8C1M+12,-19R6M+8,+2
6M-24,-7M+10,+3M+3,-12R4":PAINT(
150,66),1,1:PAINT(160,66),R,1
92 DRAW"BD28BL4ND6BL10ND9BL10BU2
ND12BL12BU2ND10BL10BU4ND10BL6ND8
"
94 DRAW"BU46BR8E2R42M+18,+22R4M-
14,-25":CIRCLE(134,36),28,1,.4,.
52,.97:PAINT(134,32),1,1
96 DRAW"M+14,-30E12F8M-14,+30G12
L5E":FORI=1TO11:DRAW"NR5NH3M+2,-
4":NEXT:PAINT(174,10),R,1
98 DRAW R$:DRAW"BM0,150":C$="R20
U8LD7L18UNR18U30RND30NR18DNR18DR
18ND8LND8":L$="ND32RD32NR18UNR18
UR18NU6LNU6":DRAW C$+"BR10U2"+L$
100 E$=C$+"L18D14NR10DNR10BD18BR
18":DRAW"BR9BD2":DRAWE$
102 DRAW"BR12BU35M+8,+32RM-8,-32
M+8,+32RM+8,-32RM-8,+32BR16"+E$:
DRAW"BR12BU35"+L$
104 A$="BD2BR12M+8,-32RM-8,+32M+
8,-32RM+8,+32RM-8,-32BD18L8DR8DN
L10R2BD12BR16":N$="U32R2D32BR16M
-16,-32R2M+16,+32RU32RD32":DRAW
A$:DRAW N$
```

# ABACUS COMPUTER DISTRIBUTORS

*wholesale distributors of tandy™ computer systems*

RAINBOW
CERTIFICATION
SEAL


Absolutely Unbelievable Prices!!
CLOSE OUT!
Sale

## COLOR COMPUTER PROGRAM PAKS from Tandy-RADIO SHACK™*

| STOCK# | DESCRIPTION | RETAIL VALUE | SPECIAL SALE |
|---|---|---|---|
| 10-1300 | SUPER BUST-OUT (ROM PACK) | $24.95 | **$1.95** |
| 10-1301 | SPACE ASSUALT (ROM PACK) | $24.95 | **$4.95** |
| 10-1302 | PROJECT NEBULA (ROM PACK) | $39.95 | **$4.95** |
| 10-1303 | POLARIS (ROM PACK) | $24.95 | **$4.95** |
| 10-1304 | MICROPAINTER (ROM PACK & CASSETTE) | $34.95 | **$5.95** |
| 10-1305 | MICROBES (ROM PACK) | $24.95 | **$4.95** |
| 10-1306 | SHOOTING GALLERY (ROM PACK) | $29.95 | **$5.95** |
| 10-1307 | PERSONAL FINANCE (ROM PACK) | $39.95 | **$4.95** |
| 10-1308 | COLOR FILE (ROM PACK) | $24.95 | **$4.95** |
| 10-1309 | SPECTACULAR (ROM PACK) | $34.95 | **$5.95** |
| 10-1310 | COLOR SCRIPT SET (ROM PACK) | $34.95 | **$5.95** |
| 10-1311 | LEARNING LAB (CASSETTE) | $49.95 | **$6.95** |
| 10-1312 | VIDEOTEX (ROM PACK) | $29.95 | **$5.95** |
| 10-1313 | CHESS (ROM PACK) | $34.95 | **$3.95** |

**BONUS!! BUY ONE EACH OF THE ABOVE 14 SOFTWARE TITLES**
**ONLY . . . . $59.95**
**ALL SOFTWARE COME WITH INSTRUCTION MANUAL AND**
**ARE ATTRACTIVELY BOXED**
**USE YOUR American Express, VISA or MASTERCARD . . . Add Shipping**
**To All Orders.**

*RADIO SHACK IS A REGISTERED TRADE MARK OF TANDY CORP.

**16012 SOUTH COTTAGE GROVE AVE. SOUTH HOLLAND, ILLINOIS 60473**
*division of union electronics, inc. (312) 339-2777*

```
106 D$="BR10U32R2D32R8UNL8UNL8D2
NE8UNE8UE8L2NU14R2U14NH8LNH8LH8L
8DR8DL8":DRAW D$
108 DRAW"BM44,190NU32R2NU32BR12"
:DRAW N$:DRAW D$:DRAW"BR26U2D32R
2NU32LU2":DRAW A$:DRAW N$
110 DRAW"BR12R18UNL18UNL18U12L2N
D12R2NL18UNL18UL18U16R2ND16NR16D
NR16DR16"
112 GOTO544
114 'CHICAGO
116 PMODE4,1:PCLS1:SCREEN1,1
118 PMODE3:DRAWB$+"BM16,61M+180,
-60R9F2RF2R2F4DG2DG2DG2LG2LM16,6
7F3G3L4M-5,-12M+7,-3M16,61":PAIN
T(16,63),B,B
120 FORI=0TO3:CIRCLE(157+I,42),2
9,4,.9:NEXT:PMODE4
122 CIRCLE(158,42),26,0,.9:PAINT
(158,42),0,0:PMODE3:PAINT(158,42
),B,4
124 PMODE4:LINE(130,41)-(220,43)
,PSET,BF:PMODE3:DRAW B$+"BM170,4
0R36M-30,-9":PAINT(200,39),B,B
126 DRAW"BM120,58C4R34M+14,+3":P
AINT(148,62),4,4
128 DRAWB$+"BM154,60L120D10M+80,
+10":CIRCLE(126,92),16,B,1,.63,.
12:DRAW"BM135,102R38F8E8R30":CIR
CLE(130,106),88,B,.55,.8,.99:PAI
NT(146,98),B,B
130 CIRCLE(32,65),15,4,.9:PAINT(
32,56),4,4
132 CIRCLE(32,65),11,R,.9:PAINT(
32,65),R,R
134 DRAW"BM142,106R26F12E12R26D8
L20G12F12R20D8L26H12G12L26U8R20E
12H12L20U8":PAINT(144,108),B,B
136 DRAW"BL12F4D32G4L42H4U32E4NR
42BF8BR4R18F4D16G4L18H4U16E4BL4B
H8":PAINT(120,108),B,B
138 DRAW"BL14NL52D8L44G2D4F2R40F
4D16G4L52U8R44E2U4H2L40H4U16E4":
PAINT(60,108),B,B
140 COLOR R,B:FORI=0TO38STEP38:L
INE(18,150+I)-(220,152+I),PSET,B
F:NEXTI:LINE(18,170)-(220,172),P
SET,BF
142 DRAW R$+"BM18,155":C$="R24DL
24D10NR24DR24U2L22U8R22BU2BR8":D
RAW C$+"ND12R2ND12D5NR22DNR22DR2
2D5NU12R2NU12BR8NU12R2U12BR8"
144 DRAW C$:DRAW"BR12NG12R2NG12R
2NG12NF12R2NF12R2NF12DNL6F5NL18D
NL18DNL18BU8BR14":DRAW C$+"BL8BD
5NL12DNL12DNL12L2ND4R2ND4BU7BR8"
:DRAW C$+"BL8ND12L2ND12"
146 DRAW"BM22,175NF10R2F10L2NE6R
2E6L2NF6R2F6L2NE10R2E10BR8ND10R2
ND10D4NR16DR16U5ND10R2D10BR8NU10
R2U10BR6"
148 DRAW"R14DL6D9L2U9L6UBR20NR16
DNR16D8NR16DNR16RU5NR16UNR16U4RD
10BR16"
150 DRAW"BR18NR18UR18U4NUL2ND4RN
L16UL16U4RND4R16DNL16UBR6R16D10L
16U10DR15D8L13U9BR20NF10R2NF10F5
E5NG10LNG10"
152 GOTO544
154 'BOSTON
156 PMODE4,1:PCLS1:SCREEN1,1
158 CIRCLE(128,106),90,0,.9:CIRC
LE(128,106),96,0,.9:PAINT(128,19
0),0,0
160 PMODE3,1:PAINT(128,190),R,4:
PMODE4,1
162 FORI=0TO1:CIRCLE(128,106),96
+I,0,.9:CIRCLE(128,106),89+I,0,.
9:NEXT
164 CIRCLE(128,106),89+I,0,.9
166 FORI=1TO5STEP4:CIRCLE(128,10
6),59+I,0,.9:NEXT
168 PAINT(128,160),0,0:CIRCLE(97
,118),10,0,.9,.2,.7:PMODE3
170 DRAW"BM94,110S4C1M+10,+4M-2,
+12M+26,+12R4NR12U10R10M+2,+10M-
2,-10U2H4M-10,-6M-6,-2M-2,-20E2U
4E2U4M-16,-4M-8,+16M-4,+16"
172 PAINT(118,119),R,1:PMODE4,1:
DRAW"C0M+4,-16M+8,-16BRM+4,-10"
174 FORI=1TO5:DRAW"M+2,+1M-4,+10
M+1,0M+4,-10":NEXT
176 PMODE3,1:DRAW"BM124,107C1M+1
0,+3D10M+20,+4R4M+16,-4M-2,-8H4M
-12,+3M+4,+12M-4,-12M+12,-3M-16,
-4L12U4LU4LU4LU4L2U6NL8L2U14L14D
4"
178 PAINT(152,110),R,1:PMODE4,1:
PAINT(130,70),0,0
180 PMODE3,1:DRAW"C1BM114,158U2N
E6NH6URU4ENE6NH6U4E2NH6NE6U4E2NH
6NE2U4"
182 DRAW"BM+30,-30ENU6NR6E2R2NU6
NR6E2M+2,-1NU5NF2R4U2NU4NF4R2ER2
NU4NF4R4ENE4NF4R2UR3NE4NF4R8"
184 DRAW"BM70,102R4NH4NG4":FORI=
1TO4:DRAW"R2E2R2NH4NG6":NEXTI
186 DRAW"BM128,68":FORI=1TO3:DRA
W"U5NG4NF4":NEXT
188 PMODE3,1:DRAWR$:DRAW"BM69,76
M+7,-8U3H3L3G2U4H3L3G3M-5,+8F3E2
F6G2F3E2NE2BU6BLE3U2L2G3F2BH5E3U
2L2G3F2":PAINT(67,75),B,R
190 CIRCLE(85,51),12,R,.9:CIRCLE
(85,51),7,R,.9:PAINT(85,44),B,R
192 DRAW"BM118,34":GOSUB194:GOTO
196
194 DRAW"U3L3D2L2H2M-13,+4DM+3,+
```

# PROGRAMMER'S SKETCH PAD

- *Saves Time & is Easy to Use*
- *Durable & Attractive*
- *Have Fun & Learn*

RAINBOW
CERTIFICATION
SEAL

*Would You Like To Design:*

- a) **BUDGETS**
- b) **INVENTORY LISTS**
- c) **GAMES, GRAPHICS**

***The Kit includes:*** Two thick mylar coated **graphs** of the color computer's screen; step by step **instructions** for the beginner; two **demo programs**, and easy to follow "how to personalize" **budgets** that *you* write.

*Each Sketch Pad* has **print locations** on one side and **set screen locations** on the other, along with their corresponding **commands** and **color codes.**

*Now you can take the screen with you wherever you go; school, work, or play. If you get a good idea, simply pull it out and draw or write down what you thought directly on the screen. When you're done with it, just wipe it off!*

*Don't delay, order yours today. . .*
*Write for catalog of other fine products*

*ONLY* $ 12

CANADA—$13.50
EUROPE—$14.50

Calif. residents add 6% sales tax.
*(Postage paid.)*

## TO ORDER:

**CALL (707) 722-4280**
**or WRITE TO:**

SYNTACTICS®
**P.O. Box 257**
**REDCREST, CALIFORNIA 95569**

### ORDER FORM SP1

Quantity ☐
Name ____________________
Address ____________________
City ____________ State ________
Country ________ Zip ________
Charge: MasterCard ☐ VISA ☐
Acct. No. ____________________
Expiration Date ____________________
Signature ____________________

*DEALER INQUIRIES INVITED*

# HARDWARE & PROGRAMS

## MONITORS

### BMC MEDIUM-RES COLOR

| | |
|---|---|
| 13" BMC w/ sound | $303.95 |
| 14" USI w/ sound | 324.95 |
| 12" Taxon Composite & RGB | 335.95 |

### COMREX HI-RES MONOCHROME

| | |
|---|---|
| 12" Amber or Green | 140.95 |
| 9" Amber or Green | 125.95 |

*Sorry, no C.O.D. on monitors.*

### COMPOSITE MONITOR INTERFACES

| | |
|---|---|
| Double Driver | 24.95 |
| Video Plus | 24.95 |

Both work great with color or monochrome on CoCo I.

| | |
|---|---|
| Coco Double Driver | 28.95 |
| Video Plus II M | 26.95 |
| Video Plus II C | 39.95 |

For CoCo II Only

### JARB DISK DOUBLER

Why spend twice as much as you need to for double sided diskettes? With our doubler, you can make your own and pay for it with the first box you double. A must for disk drive users.

5¼" size only . . . . . . . . 12.95

### BASF DATA CASSETTES

| | C-05 | C-10 |
|---|---|---|
| 1-10 | .60 ea. | .65 ea. |
| 11-20 | .55 ea. | .60 ea. |

| | |
|---|---|
| Soft Poly Cases | Ea. $.20 |
| Hard Shelled Cases | Ea. $.22 |
| Cassette Labels (12) | Sh. $.36 |
| Cassette Labels Tractor (1000) | $21.95 |

## MEMORY UPGRADE KITS

| | |
|---|---|
| **16K RAM CHIPS** | 1.50 ea. |
| **5V, CoCo II 16K** | 1.95 ea. |

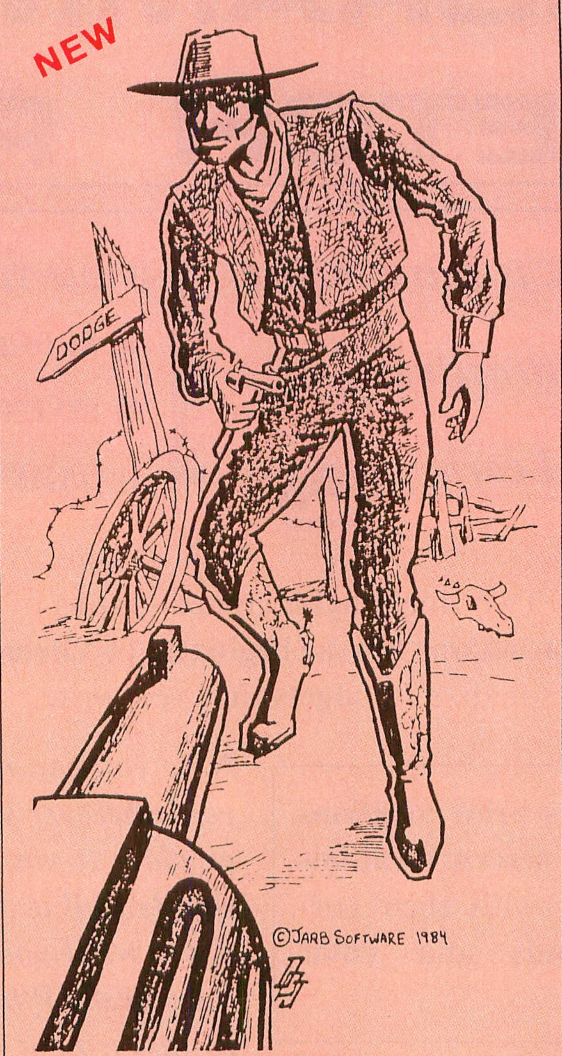
### *64K RAM CHIPS

Eight 200 NS Factory Prime 64K RAM Chips. Allows you to upgrade 'all' board easily. No soldering needed. . . . . . $52.50

### *16K/32K

Eight 200 NS Factory Prime Chips with Piggy Backed Sockets, Sam Socket, Bus Wire. Comprehensive Instructions. Recommended for "D" or earlier, but may be used on "E". Only 9 simple solder connections to kit. None to computer. $25.95

NOT FOR CoCo 2



### THE GUNFIGHTER

*BY Terry A. Steen*

An excellent hi-res, arcade quality game program for two players. Joysticks and 32K are required in this all machine language program.

Cassette . $19.95 Disk/Amdisk . $24.95

### JUNGLE TREK

Lost in a jungle with wild animals lurking; your only survival is to find a safe compound before you are lunch for lions; high resolution; multi-color.

16K EXT . . . . . . . . $14.95

### BIORHYTHM/PSYCHIC APT.

1) Prints biorhythm charts of nearly unlimited length; attractively formatted for use on most printers. 16K

2) Your psychic ability is determined through questions evaluating your psychic experiences

16K Ext . . . . . . . . Both for $15.95

## PROGRAMS FOR THE SPECTRUM PROJECTS VOICE-PAK OR SPEECH SYSTEMS VOICE

### TALKING FINAL COUNTDOWN

*(by Bill Cook)*

| | |
|---|---|
| For 32K EXT | $19.95 |
| Standard cassette FINAL COUNTDOWN | $14.95 |

### TALKING SPELL-A-TRON

The program allows the user to build a dictionary of words. During testing, the words are spoken. If an incorrect response is given, the word is spoken again and spelled. Tape (32K EXT) $22.95

### TALKING SCORE E-Z

A yahtzee type program. Up to six players can compete. All scoring and record keeping is done by the computer. Tape (32K EXT) . . . . . . . . $19.95

Standard SCORE E-Z . . . . . . . . $15.95

### TALKING COLOR MATH

The perfect educational game to aid the student in learning addition, subtraction, multiplication and division. Allows one to specify difficulty level.

Tape (32K EXT) . . . . . . . . $22.95

### TALKING SHIP HUNT

*by Cobra Software*

Play Battleship against your computer. 32K w/ joystick needed. Graphics and sound. Can be played without voice.

Cassette . . . . . . . . $10.95

SCHEMATIC DRAFTING PROCESSOR (disk) can draw large scale schematics in hi-res (has six overlapping screens) and then print them out to any of several popular printers, fast!! A must for serious hardware computerist.

Now only. . . . . . . . $49.95

### CoCo Chips

Sam, Pia, CPU, Ext, Basic

*We carry products from many manufacturers. If you don't see it, ask.*

---

**JARB** SOFTWARE HARDWARE
1636 D Avenue, Suite C
National City, CA 92050

COD orders accepted, no charge cards please.
Shipping and handling $3.00
California residents please add 6% sales tax

Order Line
(619) 474-8982
After Hours BBS
(619) 474-8981

See us at RAINBOWfest CHICAGO

```
5F2M+8,-2R2F2DGM-6,+1H2G2LF4M+13
,-3U6H3L3M-7,+1H2M+7,-2R6":RETUR
N
196 PAINT(116,33),B,R:DRAW"BM134
,47M+10,+1M+1,-4M-2,-2M+2,-6M+6,
+2M-1,+3M+3,+1M+4,-8M-12,-3M-12,
-1L3D7R3M+1,-2M+5,0M-1,+5G2LD4":
PAINT(138,46),B,R
198 CIRCLE(168,49),12,R,.9:CIRCL
E(168,49),7,R,.9:PAINT(168,42),B
,R
200 DRAW"BM175,64F6E2H2E6D18M+3,
+5M+3,-5M-2,-3M+8,-6F2E2M-5,-6G2
FM-5,+4U13H6G2F2G8H2G2":PAINT(17
7,64),B,R
202 DRAWB$:DRAW"C3BM59,141E6M-2,
-3E3M+9,+13D4G2L2H3D8F3G3H5U10G5
M-4,-6E3F2BR3BE3BDE2F3D2L2H3E":P
AINT(61,141),R,B
204 DRAW"BM73,163E3F2E6H2E3M+12,
+8G3M-6,-4G2M+6,+4G3M-6,-4G2M+6,
+4G3M-12,-8":PAINT(75,163),R,B
206 DRAW"BM94,176M+10,-14M+8,+2F
3D4M-4,+7G2L4M-10,-4BR6BU2M+5,-7
M+3,+2D2M-3,+5L2M-3,-2":PAINT(98
,176),R,B
208 DRAW"BM164,162":GOSUB194:PAI
NT(162,161),R,B
210 CIRCLE(178,157),12,B,.9:CIRC
LE(178,157),7,B,.9:PAINT(178,150
),R,B
212 DRAW"BM193,151M-2,-8M-11,+1M
+3,-4M+7,-1M-2,-6M+3,-6M+3,+10M+
9,-2R4M-3,+4M-7,+2M+1,+8M-3,+4H2
":PAINT(194,148),R,B
214 GOTO544
216 'TORONTO
218 PMODE3,1:PCLS1:SCREEN1,1
220 FORI=0TO6STEP6:CIRCLE(128,96
),70+I,4,.9:NEXT:PAINT(128,32),4
,4:FORI=0TO6STEP6:CIRCLE(128,96)
,70+I,1,.9:NEXT
222 LINE(50,82)-(64,110),PRESET,
BF:LINE(120,150)-(150,170),PRESE
T,BF:LINE(150,30)-(200,84),PRESE
T,BF
224 DRAW"BM100,96C3L66E6R2E2R2E2
R2E2R14E6F8R2F2R4F2R10":CIRCLE(1
14,92),14,3,.9:DRAW"R2DC1ND4UBR2
4DND6UC3R64D6M-36,+40F4M-22,+32M
-40,-46M-8,-6M-12,-6M-18,-6L10M-
14,-8R50"
226 DRAW"G6D2F2M+20,+10M+32,+26M
+15,-20H4M+15,-20U6L36":PAINT(11
4,92),3,3:CIRCLE(108,90),2,1,1.4
228 DRAW"BM200,84C4L26E4M-16,-12
R8M-6,-12M+12,+4M+2,-6F10M-4,-16
M+8,+4M+6,-10M+6,+10M+8,-4M-4,+1
6E10M+2,+6M+12,-4M-6,+12R8M-16,+
12F4L26":PAINT(200,83),4,4
230 DRAW"BL28C2L22M-40,-14L4G2L2
DG2DL2G2D4L2H2L2H2U2H2U4E2U2E4U2
R2M+36,-10M+34,-16E16D14R4M+8,-1
2R4D24G2M-10,-6L4M+4,+10L2G4M-10
,-4"232 DRAW"L6M+5,+14L10M+20,+1
6G4":PAINT(160,83),2,2
234 DRAW"BM88,44C4NR10UR12NE2R2E
2NF4R2F4NE4R2E4NF6R2F6NE4R2E4BD9
6BL56NR10DR12F4NE4R2E4NF4R2F4NE2
R2E2BR56BU10R2NE4R2E4R2FNE4R2E4R
2FNE4R2E4R4"
236 DRAW"BM52,74C2M-12,-4M-2,+8B
L4BUM+6,-18BR4BDM-2,+8M+12,+4":F
ORI=0TO4STEP4:CIRCLE(56,50),8+I,
2,.9:NEXT:DRAW"BU16C1NR4DNR4BR10
BU4U4BL16D4BU10BR6R4"
238 DRAW"BR14C2NFM-14,-9M+8,-6R4
M+5,+3D4G2R10L2BD2L8M+4,+2BM-8,-
4BUM-4,-3E2RF3G2"
240 FORI=0TO4STEP4:CIRCLE(90,25)
,8+I,2,.9:NEXT
242 DRAW"C2BR38BU8U14M+8,+10U10B
R4D14L4H4D4BR20U12L6BU2R16BD2L6D
12":FORI=0TO4STEP4:CIRCLE(154,22
),8+I,2,.9:NEXT
244 DRAW"BM89,31":CE$="C1NR4DNR4
BR10BU4U4BL16D4BU10BR6R4":DRAW C
E$:DRAW"BM153,28":DRAW CE$:DRAW"
BU2L6UR6"
246 DRAW"BM24,130C2M+28,-14M+10,
+16D2G6L4H2LD6G4L8M24,130BR6BD2M
+8,-4BM+4,-2M+8,-4M+6,+9D2G2L6M-
6,-8BM-4,+2M+6,+9D4G2L4M-7,-12"
248 DRAW"BR36BD6NG20BF4BL2G16M+1
2,+9BD4M-16,-12BR36BU6M-12,+20D2
M+16,+6E2M+10,-18BL4BUM-10,+16M-
8,-3M+10,-17"
250 DRAW"BR36BD10M-16,-2G2M-8,+1
8F2M+20,+2BU4M-16,-1M+2,-6M+16,+
1BU4M-14,-1M+2,-5M+16,+1"
252 DRAW"BR28BU6M+10,+18G2M-8,+2
L6BD4R8M+10,-4E4M-10,-18U2BM+18,
+20M-4,-28M+6,-4M+32,+6BD2BG2M-1
2,-2M-16,+10M+2,+12M-2,-12BU4M-2
,-10M+12,+2M-10,+6"
254 DRAW"BE8BU12F2R12E4M+10,+4BE
2BUM-10,-4U4H8L2BD3BLF4R2D4G5L5H
2"
256 DRAW"BR28BU12U10H4L6H4U16BR4
D14F4R6F4D12"
258 GOTO544
260 'CALIFORNIA
262 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3
264 DRAW"C1BM40,6R72D56M+80,+70R
2M+5,+12F6R4F6D4G6D8L2D6R4D4M-50
,+12H4U6H6M-24,-8L4M-2,-8M-18,+2
U5H2L8H8M-9,-2L8U8M-16,-30U4R2U6
```

```
L4"
266 DRAW"M-4,-9R4F4R2E2H6E4U4L4G
6M-4,-6U4M-6,-10M+2,-11M-6,-16U4
E4U6H4U10R6"
268 CIRCLE(35,12),36,R,.6,.9,.25
:CIRCLE(54,17),36,R,.6,.35,.76
270 DRAWR$:DRAW"BM64,16M-12,+36R
2M+12,-36M+12,+36R2M-12,-36BD24R
6L18DR18"
272 DRAW"BD20ND20R2ND20D4NE4D2E6
NR6DR8ND19LD19BD10BR6ND16RND16UN
R10DR12ND16R2D16L12RDR10ND8R2D8N
L14L2DL12U3L2D2"
274 DRAW"BR26BR6R12DRL15ND16RD16
RR16U4L2D5L14U9R14UNL14U6RD5BR14
ND28R2D28BR14NR12DL2R16ND6LND6L1
4ND10RD10NR12DR14ND8LD9L12UNR12U
4L2D4
276 GOTO544
278 'NEW YORK
280 PMODE4,1:PCLS1:SCREEN1,1
282 CIRCLE(128,86),92,0,.9
284 CIRCLE(128,86),96,0,.9
286 PAINT(128,170),0,0
288 PMODE3,1:PAINT(128,170),R,4
290 CIRCLE(0,86),96,R,.9,.88,.14
:CIRCLE(255,86),96,R,.9,.38,.63
292 LINE(76,118)-(178,136),PSET,
BF:LINE(174,128)-(154,30),PSET,B
F
294 CIRCLE(160,64),42,R,.6,.59,.
96
296 DRAW R$:DRAW"BM202,58F2M+4,+
10M-28,+19M-2,-4M+28,-19BH10M-22
,+26M-6,-2M+16,-34BL16BU4M-6,+36
M-9,-1U35BL12BD2M+6,+33L4M-12,-2
8BG6M+14,+22"
298 PAINT(144,74),R,R:PAINT(158,
76),R,R:PAINT(176,78),R,R:PAINT(
190,78),R,R
300 CIRCLE(146,98),38,B,.5,.72,.
93:DRAW B$+"BF4L4M+1,+6R6DR6DR4D
R4DR4DR2DR2DR2DR2NE6":PAINT(164,
90),B,B
302 CIRCLE(130,124),70,B,.54,.71
,.98:CIRCLE(116,101),17,B,.8,.2,
.7:CIRCLE(126,134),80,B,.54,.71,
.95
304 DRAW"BM124,112BM+32,+5BR44BD
2D6L2D2R"
306 DRAW R$:DRAW"BM58,136":FORI=
1TO2:DRAW"M+24,-64L2M-24,+64":NE
XTI
308 FORI=1TO4:CIRCLE(56,100-I),1
2,R,.8,1,.48:NEXTI
310 DRAW"BM48,100":FORI=1TO3:DRA
W"M+12,-38LM-12,+38":NEXTI
312 FORI=1TO4:CIRCLE(48,62-I),12
,R,.9,.5,1:NEXT:FORI=0TO2:CIRCLE
(48,57-I),12,4,.9,.5,.8:NEXTI
314 FORI=1TO4:CIRCLE(80+I,126),1
1,R,1,.2,.9:NEXTI
316 DRAW"BM88,136M+6,-20LM-6,+20
U4R6D2R2D2R4M+6,-16NR3DR6M-4,+15
RM+4,-15NR6R2UR6M-2,+16R2M+2,-16
M-2,+16NR6UR8M+14,-30R6DR4DR4F2M
-60,+100R2E2H2M-4,-1G4M+4,+1BU4B
R2M+28,-50"
318 DRAW"R2C4M-19,+36RM+19,-36":
FORI=0TO2:CIRCLE(146+I,124),10,R
,.5,.85,.25:NEXTI
320 DRAWR$+"BM144,128NF6R2F6":FO
RI=1TO2:DRAW"R2NE12R2E14R2F2D2G4
L8G4F2R8":NEXTI
322 DRAW"R2NE12R2E14D2G2ND6L2D8G
2L4NH2R12C4E8R2G8DNL6"
324 DRAWB$:DRAW"BM124,112R14U4R2
U4R7DR5DR5DR2D3G2R4DR4E2RE2RUH4M
-16,-4L18DL2D4F2R4":PAINT(134,10
2),B,B
326 DRAW"BR18BD8R6DR4DR4DR4DR4DR
4DR4BR8BDR4"
328 DRAW"C4BM143,84R3L2NU2ND2":F
ORI=1TO2:DRAW"BR10R5L3NU2DRL2NF3
RNG3LU3D2L2BD2BR":NEXTI:DRAW"BR1
0BD2G2"
330 DRAWR$:DRAW"BM70,30":FORI=1T
O6:DRAW"NR8NG6BM+4,+5":NEXT:DRAW
"BL2":FORI=1TO6:DRAW"NR8NG6BM+1,
+5":NEXT
332 DRAW"BL3":FORI=1TO4:DRAW"M+8
,+2M-8,-2NG6BD7BL":NEXT:DRAW"BD2
0BL16NL6NF6BG4NF6NL4BR122L6NG6BH
4NR6NG6BU102BL4NF6NL8BE6BL2NF6NL
8"
334 PMODE4:LINE(138,120)-(104,18
0),PRESET:LINE(138,126)-(106,178
),PRESET:LINE(138,132)-(110,172)
,PRESET
336 GOTO544
338 'MILWAUKEE
340 PMODE3,1:PCLS1:SCREEN1,0
342 CIRCLE(128,120),20,2,.9:PAIN
T(128,116),2,2:CIRCLE(128,120),2
6,2,.9
344 FORI=0TO6STEP6:CIRCLE(128,12
8),50+I,2,.9,.65,.4:NEXTI
346 DRAW"BM86,158C2M-54,-99U4E4M
+40,-26M+20,-5R18F8M+9,-3R18F8M+
9,-3R12M+8,+3F12D30M-3,+20M-6,+1
8G6"
348 DRAW"BM86,158BE4M-52,-96U2M+
40,-26F4G12M+20,+50D2R4E6BL6M-16
,-44M+10,-14M+10,+14M-6,+40BE6BR
M+6,-34U2M-14,-20E3R18F8DR2M+8,-
3R16F8"
350 DRAW"M+12,-4R10F2R4F10D32M-3
,+20M-6,+16BL84BU26U10BR30C1NF4C
```

```
2U30E4F4D20M-4,+12DBR28BD8C1F2L2
U2C2U40E4F4D30M-4,+12"
352 PAINT(86,46),2,2:PAINT(72,36
),3,2:PAINT(99,26),3,2:PAINT(128
,100),4,2:PAINT(128,80),4,2
354 DRAW"BM110,124C4R10M+14,-8R1
2UL12M-14,+8L10"
356 DRAW"C3BM36,36H8F2E4NF6F2E4N
F6BR18H6BH2UBR18BF4M-6,-9BR18BU2
F6E4F4E6BR12R6F2D4L8U3R8BU3BR14D
6R6NU6BR14U8D4R2NE3F4BR16BD2NF6E
4R2F4D4NH6BR8BD8NF6E4R2F4D4NH6"
358 DRAW"BM66,180M+6,-12M-3,+6M+
8,+3M-3,+6M-8,-3BR20BD5M+2,-8D2R
4BR8BD2R6D3L8NE2D3R6BR16BDNH6E4F
4E6BR10BDE2R6D3L8D3R8BR12BU2M-3,
-6D2FE4BR16BD4E6H3G6H3E6"
360 GOTO544
362 'TEXAS
364 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3
366 DRAWR$:DRAW"BM70,60R70D24L22
U10L4D34R6D16L32U16R6U34L4D10L22
U24R72D24BD2NR16L22D20R6D20L6D20
R30U20L6U12M+26,+30R2DR2DR12U18M
-16,-12"
368 CIRCLE(148,103),32,R,.6,.77,
.14
370 PAINT(72,62),R,R:PAINT(148,9
0),R,R
372 DRAW"C4BH20BD4BR2L10F3DG2RNU
6M+4,-3M+4,+3NU6R2H2UE3GL8FR6DL6
U5RU2D3R2U
374 CIRCLE(90,102),47,B,.9,.17,.
65
376 DRAW"BL102BU4NL2BU"+B$+"L24D
8M+11,+9M+2,+9R2D3F4R4M+3,+6F4R1
2UC4NR2"+B$+"BUL8H4U2L2U2M-6,-3L
2H2M-2,-9M-11,-12U5R18":PAINT(40
,100),B,B
378 DRAW"BR18BU24U14R18BR4R36U26
L36D26BL4U28R44D28":PAINT(110,46
),B,B
380 DRAW"R20D12BD4D10NR10":CIRCL
E(148,102),38,B,.55,.77,.14:DRAW
"U10M+30,+4R12F2D8F4D2F2D16G8L2G
2M-6,-4BM+6,+4BF4BU2E3R2E9U16L2U
4LH4U14L20M-30,-4"
382 PAINT(148,78),B,B:DRAW"BR44B
D56NH2D24L22H10L3D10BL6L34U12RC4
NUND"
384 DRAWB$+"BL24BD6C4LNH4"+B$+"B
R2M+12,+16R4M+14,+18R4F4R10E2R2F
2R8E4U4M-12,-18U2E2U2BR6D2G2D2M+
12,+18D6G6L10H2L2G2L17H4L4M-14,-
18L4M-12,-16U6"
```

# FREE PROGRAMMING GUIDE

**With every order placed before July 1, 1984, we will include a copy of THE GUIDE TO STRING VARIABLES by J.D. German, absolutely free! This valuable booklet tells you how to unlock the full power of your Color Computer by using the many string variable commands available in Extended Color Basic. It's written in clear, easy-to-understand language and includes plenty of examples and review exercises to lead you through the subject at your own pace.**

**THE GUIDE TO STRING VARIABLES (When ordered separately) .......................... $3.95**

**JOYSTICK PLUGS! Deluxe, heavy duty 5 pin DIN connectors to fit the joystick input ports of your Color Computer. Includes instructions and wiring diagram ............ $4.45/each or $8.00/pair**

**☆☆☆ Educational software for the Color Computer ☆☆☆**

- ★ **MUSICAL STRINGS. An entertaining tutorial that stimulates muscial creativity and teaches basic computer string variable concepts. 10-year-olds to adults ........................ $17.95**
- ★ **CUSTOM FLASHCARDS. This great study aid lets you quickly create and save your own sets of flashcards about any subject, in any format. .......................................... $17.95**
- ★ **ALPHABET SOUP - A word recognition and spelling game for the whole family .......... $15.95**
- ★ **COLOR MATH QUIZ, DECIMAL MATH QUIZ, and FRACTION MATH QUIZ - A trio of math drill programs featuring five skill levels, multiple choice answer formats, and entertaining music and graphics to keep ages 4 (with help) to 16 interested ............ each $15.95 or all three for $42.95**

**For more information, write for a free catalog.**

**ALL PROGRAMS ARE ON CASSETTE FOR THE COLOR COMPUTER OR TDP-100 WITH A MINIMUM OF 16 K OF MEMORY AND EXTENDED BASIC.**

**SEND CHECK, MONEY ORDER**
**OR PURCHASE ORDER, PLUS**
**$2.00 SHIPPING AND HANDLING TO:**

**Creative Technical Consultants**

P.O. Box 652 Cedar Crest, NM 87008

```
386 PAINT(128,176),B,B
388 CIRCLE(54,98),16,R,.9,.75,.9
7:DRAWR$+"BM70,98D30R4NR6NG6D4R4
NR6NG6D4R4NR6NG4D4BH12BU4":FORI=
1TO6:DRAW"NF6NG6BU6":NEXTI
390 DRAW"BD6":FORI=1TO3:DRAW"BH4
NR6NG6":NEXTI
392 GOTO544
394 'OAKLAND
396 PMODE3,1:PCLS1:SCREEN1,1
398 FORI=0TO8STEP8:CIRCLE(128,96
),88+I,2,.9:NEXTI:PAINT(128,16),
2,2
400 A$="BM128,96R10M-10,-26M-10,
+26R10BR26M-15,-39H8L14G8D4R2E4R
4F4M-6,+12H4L6G4D6E4R5F2M-18,+38
L6G6D4E2R2E2R8F2R4F2R4F2R4E10U2L
2G2L8H2M+5,-12R24M+7,+21M+6,+2R8
E4U2E4U4E4U4L2G4L9M-10,-26"
402 DRAW"C4":DRAW A$:PAINT(128,9
8),4,4
404 AP$="R2E6U6L8D6R2D4BF12F2R8E
2U4H2L4H2U2E2R2F2R2U2H2L8G2D6F2R
4F2L8D2":DRAW"BM156,80C4"+AP$:PA
INT(158,72),4,4:PAINT(172,78),4,
4
406 FORI=80TO190STEP4:LINE(I,48)
-(I,130),PRESET:NEXT:DRAW"BM156,
80C2":DRAW AP$
408 DRAW"C2":DRAW A$:DRAW"BM80,6
0":FORI=1TO2:DRAW"M-16,-8M+6,-8R
2M+16,+10M-6,+8BM-2,-1":NEXT:DRA
W"C1R4DL4C2"
410 DRAW"BU12BR12M-6,-16R2M+19,+
10UM-19,-10BD14BR2M+8,-5BR14M-4,
-16M+2,+8R2NE8E2F8BR6BUM+4,-14M-
4,+14M+8,+2BR4BDM+14,-12D18U8M-7
,-4M+7,+4D8BF2BR2M+12,-14M-3,+18
E12BF4BR4M-14,+12NH2F4R2RFR2E8U6
H2L2H2"
412 DRAW"BM56,128M+16,-4R2M-10,+
14M+5,-7NH5BD14BR4E12M-7,-5M+7,+
5M+6,+4BR4BD2M-8,+16M+4,-8M+10,+
4M+4,-8M-8,+16BR12BD4M+4,-16M-4,
+16":DRAW"M+8,+2BR8NR8U8NR8U8R8B
R6M+16,-5M-8,+3M+5,+16BE6BR10M-8
,-16BE2BR6NE6M+12,+10R2E6"
414 DRAW"BR4BU4M+4,-6U2H2L4G2L4H
2U2E4"
416 GOTO544
418 'DETROIT
420 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3
422 CIRCLE(128,88),54,B,.6,.55,.
95:CIRCLE(130,100),60,B,.85,.1,.
3:DRAWB$:DRAW"BM76,82NU2G4D4GD12
F2D12F2D8F2R2F4R2F2R4F2R4F4R2F4R
2U2R2F2NF2BR66BU18E4U10R2U8R2U10
H2U2H2U4H2U4H2BH10BD2E4U6L2U4H4L
4G2L2D2G4D2BF6BR4U6H2U2R2U2R2F2B
L60BD4L8H2L2H2L2H4L4G2D2
424 DRAW"G2D2F2D2F2R2":PAINT(128
,60),R,B:FORI=2TO12STEP2:CIRCLE(
108-I,92+I),24+I/2,B,1.2,.3,.7:N
EXT:FORI=2TO20STEP6:CIRCLE(128,1
30),24+I,B,.5-(I*.005),.95,.57:N
EXT:FORI=2TO12STEP2:CIRCLE(157,9
2+I),22+I/2,B,1.3,.8,.2:NEXT
426 FORI=0TO36STEP36:FORY=4TO6:C
IRCLE(112+I,86),Y,4,.9:NEXTY,I:D
RAWB$:DRAW"BM118,62R20FL16BD4NR1
2DL4NR12BD4R22DL18DR22BR2E4R2F2D
2H2L2G4D2E4F4BR4NH6R2NH8BR4BU8NH
8R2NH8BL10H4BG20BL10NH4M-8,+16U1
2D4L4BL4BD4L2G2L2H4"
428 FORI=0TO36STEP36:CIRCLE(112+
I,86),6,B,.9:NEXT:DRAW"BL8U4E3U4
E4U4E4U2E4BR4BD10D4R2NU4BL8BD4H2
NE4BD6L2D2R2F4BD8L8H2BD4BL2F2R4E
2R4F2R2F2R2BU4L2H2L2BD8NF4L4H2BD
4F2R6F2R2F2BU6BR6R2E2R4F2R4E2R4F
2BD4BL2C1NU2L2NU2G2L8H2NU2L2NU2"
430 DRAWB$:DRAW"BD4BL2R4E2R8F2R4
F2UL6H2L8G2L6D4R20BDBL2L16R2DR10
L4DL4R2DBD8NR8L4M-12,-4NE6L2NE6L
2E6BE6C4ND2RND10NL16M-18,-2BU2M+
18,+4M-22,+4BR60M-16,-4NR20M+24,
-4BU4M-24,+4F4G4F2NR2ND2L2D6BD4B
L4H2D2BL10H2D2":DRAWB$:DRAW"BR18
E6U4BU18BR4M-10,-24F6R4"
432 DRAW"E8RG8L2ND4F4R2E10R2G12D
E14BD8D6LU4L2D6F2D2H4LF6BL6NE4G6
LNE10BU4BL2NE6HNE6H2NE4H2NE4BH20
BL4H4R2F4BR4NU4R2NU4BU6BL18H4BH2
0BL8BD4F4D2L2U2H6R2NE2D6F4":PAIN
T(166,58),B,B
434 PMODE4:FORI=0TO24STEP24:CIRC
LE(128,100),76+I,0,.9:NEXTI:PAIN
T(128,16),0,0:PMODE3:PAINT(128,1
6),B,4:DRAW"BM60,50C4NH4F4ENH8RN
H8NE10LE10NU4RU5NH4LH4NG10L2NG10
DNR4BE8BR2M+16,-6DLM-16,+6DLM+16
,-6DLM-16,+6NF8ENF8RF8H5M+16,-6D
LM-16,+6F4M+16,-6DRM-16,+6"
436 DRAW"M+16,-6BR12BUM-4,-12RM+
4,+12M-4,-12UM-10,+2DM+10,-2M+10
,-1UM-10,+1BR18UD14R2U14M+12,+1D
M-12,-1M+12,+1NF2RF2ND2LD2NG2LG2
NL8DL8R4NF6RF6":FORI=0TO2:CIRCLE
(160+I,28),11,4,.9:NEXT:DRAW"BF1
8BR12BU6NE10R2E10BF4NF12DF12H6NG
10UG10UE10"
438 DRAW"BM60,160NE10RNE10DNE10R
E10NH6NF5RNH6F5BF4BR2M-4,+12RM+4
,-12RM-4,+12RM+4,-12":FORI=1TO3:
CIRCLE(104+I,174),12,4,.7,.1,.9:
NEXT:DRAW"BF16BR4BDR8UNL8D2BD6BR
10NR14UNR14U4RND4R12UL13U6RND6R1
```

★ COLOR COMPUTER WORD PROCESSOR ★

# Elite•Word™

## Also Available On OS-9

*THE SECOND GENERATION WORD PROCESSOR IS NOW . . . ELITE•WORD has many new features not found in other word processors for the Color Computer. ELITE•WORD is an all machine language, high performance, Full Screen Editor which offers an ease of use that is simply incredible. ELITE•WORD also offers a printed output flexibility that can handle your sophisticated home and business applications. ELITE•WORD is waiting to work for you.*

**MAJOR Features include:**

- **ALL Machine Language for speed**
- **Handsome Vinyl Binder**
- **Comprehensive Manual Included**
- **User Friendly (really)**
- **Top screen line reserved for command prompts, HELP messages, and status information**
- **Two text entry modes: Insert and Exchange**
- Edit 2 files simultaneously (OS-9 Only)
- Delete character under cursor
- Backspace and delete one character
- Delete entire screen line
- Rewrite entire screen
- Page Forward through text
- Page Backward through text
- Mark present line for automatic centering on output
- Insert new text (Insert mode)
- Type over old text (Exchange mode)
- Screen Display is 32x19 in normal text editing modes
- Screen Display is High-Res 64x19 when used to display final text; including page breaks and justification
- Screen Display in all modes is true Upper/Lower case characters with descenders
- Over 13.5K file size in 32K machines
- Continuous memory display
- Save text file (disk or tape)
- Load text file (disk or tape)
- All I/O errors trapped and recoverable
- Jump to beginning or end of text
- Find any string of characters in text
- Global replacement of one string in text for another
- **True block-text Move command**
- **Smooth cursor movement over text in any direction (including vertical)**
- **Smooth screen scroll for easier proof reading**
- **Auto Key-Repeat will automatically repeat any key that is held down**
- **Easy generation of ASCII files**
- **VIEW function permits high-res screen display of final text before it's printed; including right-side justification and page breaks**
- **VARIABLE TEXT MERGE allows for generation of standard form type letters that appear to be personally prepared for each reader**
- **INCLUDE feature (disk only) permits the inclusion of many other files within one large document. Total document will have sequential page numbering**
- **EXCELLENT FOR PROGRAM EDITING AND WORD PROCESSING.**

THE BEST FOR ONLY

Specify

| | |
|---|---|
| Tape | $59.95 |
| RS Disk | $59.95 |
| OS-9 Disk | $79.95 |
| OS-9 & RS Disk | $109.95 |

see us at RAINBOWfest CHICAGO

*— Shipping from stock NOW*

*— Dealer Inquiries Invited.*
*Add $2 Postage & Handling*
*PA residents add 6% sales tax*

MasterCard VISA

- **Type ahead keyboard buffer NEVER misses a character**
- **Optional screen display of all carriage returns <cr>**
- **Fast Disk I/O . . . No loading of overlay files to slow program operation**
- **User HELP display available**
- **Automatic screen Word-Wrap; even while inserting new text**
- Block-text move, copy or delete
- Display/Change default disk drive number (disk only)
- Display disk directory (disk only)
- Display-Free disk space available
- Software remembers last file name Saved or Loaded and will write to that file by default if desired
- Dynamic margin changes within text
- Select Top margin, Bottom margin, and Page length
- Choose number of duplicate copies
- Page Pause, for single sheet users, if desired
- Optional page numbering begins with any selected page number
- Printer Font codes are user definable
- All printer format options may be changed dynamically within text
- Any string of HEX characters may be imbedded within text to send any special control codes to your printer
- An Eject (top of form) command may be inserted within text
- Variable Text Merge symbols may be inserted anywhere within text
- All machine language; 32K and Extended Basic required for ROM-call routines

OS-9 is a trademark of Microware and Motorola.

*Elite Software*

Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

> **"I was more than satisfied with Elite*Word. Before I started the review, I thought that it would be just another program that would copy most of what others had done and add a few whistles and bells. After the review, I would not hesitate to compare it with the two best selling CoCo word processors. And my comparison places it at the top of the list."**
>
> **- A. Buddy Hogan, Rainbow**

```
2UNL13BR8BE2M+4,+12RM-4,-12RM+4,
+12M-2,-6E2R2F6RH6R2E2U2
440 DRAW"H2L6GLE2R6BR8BU3E2R2E2R
2E2DG2L2G2L2G2NF4RF4NE6DE6R2NF4L
F4NG4DG4NL4DL4"
442 GOTO544
444 'KANSAS CITY
446 PMODE4,1:PCLS1:SCREEN1,1
448 DRAW"C0BM128,30R50D80M-50,+2
8M-50,-28U80R50BD28L40D2F2R6D46L
6G2D2R26U2H2L6U20R10M+36,+24R10E
4U6H2L4G2D2F2D2L2M-30,-20R10":CI
RCLE(126,74),22,0,.8,.77,.16:CIR
CLE(122,74),18,0,.7,.77,.16
450 DRAW"BU4BL6L26U21R20":PP=0:F
ORI=0TO B STEP B:PAINT(128,32),I
,PP:PAINT(116,68),I,PP:PP=4:PMOD
E3:NEXTI:FORI=10TO12:CIRCLE(152,
56),I,R,1,.1,.9:NEXTI:DRAWR$:DRA
W"BM142,56L4H10L2D10R2D2L6U2R2U2
0L2U2R6D2L2D12R4E12L2U2R6D2L2G12
F12"
452 DRAW R$:DRAW"BM128,26R50NU16
L100U16":FORI=1TO4:CIRCLE(66+I*2
5,10),12,R,.9,0,.5:NEXT:PAINT(12
8,24),R,R:FORI=1TO5:CIRCLE(54+I*
25,4),6,R,.9:PAINT(54+I*25,4),R,
R:NEXTI:PMODE4:FORI=0TO28STEP2:L
INE(20,I)-(230,I),PSET:NEXTI
454 PMODE3:CIRCLE(60,192),10,B,.
4,.5,1:CIRCLE(72,192),24,B,.5,.5
,.7:CIRCLE(87,192),18,B,.5,.5,.7
:DRAWB$:DRAW"BM80,184M+120,-20BU
4M-134,+20M+134,-20BH4BL2H2":FOR
I=0TO6STEP6:CIRCLE(200,156),8+I,
B,.6,.6,.25:NEXT:PAINT(60,186),B
,B
456 DRAW"LF4R4E12NU6L2NU8L2U10E2
L2G4L2NE2NG12L2G12NL4GL4NH4UH4NU
26L2U26NE4R2NE4L2D26F2NG4L2G4":C
IRCLE(178,130),10,B,1.9,.8,.2:DR
AW"L4NU14H2U12D4NH4L2H4L2G2D12L2
NU12F2R6E2R2BL14NL8DL10R2NG8R2G1
0ND16G2D14NF4R2F4E2NU40R2U42D18N
L10UL12NU14L2U12"
458 DRAW"D4NL6DL8NH6L2H6L2NG6L2G
6ND8G2D6NF4R2F4R4NE4R2E4NU8L2U8L
2NH4L2H4BL4BD15NL6DL8GNR6LGNR6M-
6,-12HM+6,+12HLM-6,-12NL4HL6UNR4
L2":FORI=1TO3:CIRCLE(74-I,140),1
6,B,.6,.5,.2:NEXT:DRAW"UL4U8E2G2
ND24G2D24NG2L2NG2L2NH2L2NH2"
460 GOTO544
462 'SEATTLE
464 PMODE4,1:PCLS1:SCREEN1,1
466 C$="C0M-24,+48L64M+52,+26M-2
4,+48M+60,-30M+60,+30M-24,-48M+5
2,-26L64M-24,-48":DRAW"BM128,0S5
":DRAW C$:DRAW"BM128,16S4":DRAW
C$:PAINT(128,4),0,0
468 PMODE3:DRAW R$:C$="BM128,52L
10M-8,+16L24M-18,+36L16F20M+30,-
20L10M+6,-20R10M-4,+20L6M+30,+20
M+30,-20L6M-4,-20R10M+6,+20L10M+
30,+20E20L16M-18,-36L24M-8,-16L1
0":DRAW C$:PAINT(128,54),R,R:DRA
W"C4":DRAW C$:PAINT(128,54),1,4:
DRAW R$:DRAW C$
470 DRAW B$:DRAW"BM90,150R6U4L6U
4R6BR4NR6D4NR6D4R6BR4M+2,-4NR4M+
2,-4M+4,+8BR8U8L4R8BR4R4ND8R4BR4
D8R6BR4NR6U4NR6U4R6"
472 DRAW"C1BM14,170U4R4U8L4U4R8F
8E8R8D4L4D8R4D4L10U4R2U6G8H8D6R2
D4L10":PAINT(18,168),1,1:DRAW"BR
36U4R2M+4,-8L2U4R14D4L2M+4,+8R2D
4L6U2H4L2G4D2NL6BU10":PAINT(54,1
68),1,1:DRAW"C4BR6RUL2DBD10BR18"
474 C$="C1U4R4U8L4U4R18F4D2G2L4F
4R4D4L10U4H4L2D4R2D4L8":DRAW C$:
PAINT(84,168),1,1:DRAW"C4BR8BU10
R3UL3DBD10":DRAW"BR20C1U4R4U8L4U
4R16D4L4D8R4D4NL16":PAINT(116,16
8),1,1
476 DRAW"BR6U4R4U8L4U4R12F12U8L2
U4R10D4L2D8R2D4L12H10D6R2D4NL10"
:PAINT(154,168),1,1:DRAW"BR26U4R
4U8L4U4R20D6L4U2L8D4R4DL4D3R8U2R
4D6NL20BR6":PAINT(184,168),1,1:D
RAW C$:PAINT(198,168),1,1:DRAW"B
R8BU10C4UR3DL3BD10BR20"
478 DRAW"C1U4R4F2R4E2U2L10H2U6E2
R16D6L4U2L6G2F2R8F2D6L16":PAINT(
226,168),1,1
480 PMODE4:FORI=14TO242STEP4:FOR
Y=0TO178STEP2:PRESET(I+OF,Y,1):N
EXTY,I
482 GOTO544
484 'BALTIMORE
486 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3
488 FORI=0TO25STEP25:CIRCLE(128,
92),80+I,1,.9:NEXT:PAINT(44,92),
R,1:DRAW"C1BM124,92H8NL2NR2F8DR6
UL7NH2R23H4M-8,-2L8H4L2H2L6G4D6F
4RFR16":CIRCLE(131,102),8,1,.9,.
75,0:DRAW"BD2BR6NE4BR2BD6D10R8U1
0M+8,-3D12M+6,-14M+12,-4"
490 DRAW"M-9,+18NL16M-6,+12G6D4R
4E2U2R4F2D2G2D12M-8,+2L8H2E2M+10
,-1U4H2L4G2L2M-6,-12M-6,+2M+4,+8
G2L4H2M-4,-8M-6,-2G2L2M-4,-12R6F
2R2F4R2E6M-4,-12L8M-18,-4H2L2G2D
6F10NR2H10U2L2DL2DL2DL4H2M-2,-12
L4H4UH2U4E2R2E2"
492 DRAW"R4F2D4M+30,+9":PAINT(80
```

★ COLOR COMPUTER WORKSHEET ★

# Elite•Calc™

*NOW . . . The worksheet calculator program you've been waiting for is waiting to work for you. ELITE•CALC™ is a powerful, full featured worksheet calculator designed especially for the Color Computer. Answer "what if" questions, prepare reports, maintain records and perform other tasks that, until now, required sophisticated business computers. ELITE•CALC™ is a serious tool for those who want to do more than play games with their Color Computer.*

**Features include:**

- Single character commands
- Help Displays
- Enter text or formulas to 255 characters long
- Repeat text entries
- 255 maximum rows
- 255 maximum columns
- Available memory always displayed
- Rapid Entry modes for text and data
- Selectable Automatic Cursor movement
- Insert, Delete, Move entire rows or columns
- Replicate one cell to fill a row or column with selectable formula adjustment
- All machine language for speed
- Extended BASIC required for ROM routine calls
- Automatic memory size detection for 16K, 32K or 64K
- >20K bytes, storage available in 32K systems
- BASIC style formulas
- Math Operators: +, −, X, /, ↑, (, ), =
- Relation Operators: =, >, <, <=, >=, <>
- Logic Operations: AND, OR, NOT
- Conditional Formula: IF . . . THEN . . . ELSE
- Trig Functions: SIN, COS, TAN, ATN

- **EASY TO USE**
- **INDIVIDUAL CELL FORMULAS**
- **COPY BLOCKS OF CELLS**
- **FULL CELL-EDIT CAPABILITY**
- **COMPATIBLE WITH ALL PRINTERS**
- **EASY 132 COLUMN PAGE WIDTH**
- **CHANGEABLE BAUD RATES**
- **GRAPH FORMAT FOR BAR CHARTS**
- **SORT IN ASCENDING OR DESCENDING ORDER**
- **COMPREHENSIVE MANUAL INCLUDED**
- **NATIONWIDE USER GROUP**
- **HANDSOME VINYL BINDER**

**THE BEST FOR ONLY**

# $59.95

*Specify:* **Disk or Tape**

*— Shipping from stock NOW*

*— Dealer Inquiries Invited.*
*Add $2 Postage & Handling*
*PA residents add 6% sales tax*

- Log Functions: LOG, EXP, SQR.
- Misc. Functions: INT, FX, ABS, SGN.
- Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP
- Nine digit precision
- Definable constant table
- User definable printer set-up commands
- Individual column width settings
- Adjustable row height to insert blank lines without wasting memory
- Hide columns or rows
- Alternate print font selectable on cell by cell basis
- Display/Print formats set by cell, row, or column
- Dollar format, comma grouping; prefix or postfix sign
- Scientific notation, fixed point and integer formats
- Left and Right cell contents justification
- Full page formatting
- All formats stored with worksheet on disk(tape)
- Save & Load Disk(tape) files in compact memory form
- Scan disk directories
- Output ASCII file for word processor input compatibility
- Memory resident code . . . no repeated disk calls

Sample worksheets included

*Elite Software* Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

MasterCard VISA

*"Elite∗Calc is a great spreadsheet program ! This professional quality program has the performance required for serious home applications as well as small businesses."*
*Stuart Hawkinson, Rainbow*

*"Truly one of the best programs I have seen."*
*John Steiner, Micro*

*"Elite∗Calc is an extremely powerful worksheet . . . "*
*Jack Lane, Color Micro Journal*

*"Bruce Cook's Elite∗Calc is a very fine program indeed; potentially one of the great Color Computer Programs." " . . . a very impressive product."*
*Scott L. Norman, Hot CoCo*

```
,83),1,1:PAINT(166,98),R,1:PAINT
(150,102),R,1:PAINT(98,104),R,1:
PAINT(112,82),R,1:DRAWR$:DRAW"M-
30,-9U4H2UE2R8D4F2D4L6":PAINT(86
,84),1,R:DRAW"BD14BR8M-16,-6BU6B
R22BD2C1M+9,+2M-9,-2H4U12E4"
494 DRAW"R10F2R2F2R2F2RD2G2D2F2R
4NU2R2NU3R2U4H2NL4F2DE2R2F3DGLUE
H3R10E4RG4M+12,+1R2E4U4M+20,-4M-
20,+4DM-32,+2NL8R4U10H4L2U4L4D4N
R4M-9,-2G4D6BR24BU2M+42,-12R4F4D
6G4BL90BD10U2R2UR3D8L2DL2"
496 PAINT(138,70),R,1:PAINT(132,
70),1,1:PAINT(110,74),1,1:DRAWR$
:DRAW"U8R2D8":PAINT(154,80),R,1:
PAINT(142,80),R,1:DRAW"BL22C1BD8
M-8,+2D4G2L4H2M-4,-12U4E4M+4,+16
M-4,-16R4F2D4M+8,-2":PAINT(68,92
),R,1
498 DRAW"BM58,50C4NH8U2NH8R2H8NE
10R2E10R2D2R2NG10R2NG10NF4DF2NG1
2D2NG10BE6BDNU14R2U5M+8,-4UM-8,+
4U8M+14,+7R2M-14,-7UM+14,+7BE2BR
4BUM-4,-12R2M+4,+12M+12,-2UM-12,
+2BR10BU14R21DL10D12L2U12L9BR28M
-2,+12R2M+2,-12BR10BDM-4,+12R2M+
4,-12NF6RF6"
500 DRAW"NR8UR8DM-6,+10R2M+6,-10
":FORI=0TO2:CIRCLE(180+I,26),10,
4,.8:NEXT:DRAW"BF18BL2BD7NE10DE1
0NF6DF6NG4LG4NH4LH4D8BD6BR4NE10D
E10NF4DNF4G4NF4DNF4G4NF4DNF4":FO
RI=0TO2:CIRCLE(64+I,150),10,4,.8
:NEXT
502 DRAW"BM72,162NE10DE10NF6DF6N
G4LG4NH4LH4M+2,+8BR10BD6M+6,-14R
M-6,+14R2M+6,-14":FORI=0TO2:CIRC
LE(112+I,172),10,4,.8:NEXT:DRAW"
BR34BD7D12R2NU12M+14,-2UM-14,+2B
M+22,-3M+14,-6UM-14,+6M-1,-4M+14
,-6UM-14,+6M-1,-4M+14,-6UM-14,+6
"
504 DRAW"BE10BR10M+12,-8DM-12,+8
M+2,+4M+12,-8DM-12,+8M+12,-8M+2,
+4M-12,+8DM+12,-8"
506 GOTO544
508 'MINNESOTA
510 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3
512 DRAWB$:DRAW"BM128,192L80M-4,
-20M+8,-40M-8,-4M+6,-12M-4,-40M+
6,-12M-14,-30M+8,-20R60U6R8D8R12
F10R6F8M+12,+4R4M+12,-4R4M+12,+4
M+20,-2D4M-30,+20D4M-16,+12M-6,+
20D60F8D4F10D14L50":PAINT(128,19
0),B,B
514 CIRCLE(106,74),54,4,.9:PAINT
(106,34),4,4:FORI=0TO30STEP30:CI
RCLE(142+I,160-(I/2)),60,4,1,.2,
.7:NEXTI:PAINT(128,188),4,4:CIRC
LE(106,146),60,4,1,.4,.7:DRAW"C4
BM60,184R8E4F4M+12,-3U8L10H2U4M+
4,-20M-3,-14E6M+14,+3U6M-10,-2U8
R44D6M-16,+5"
516 DRAW"D6M+12,-3M+3,+12D4F4M-8
,+16F10R4M-2,+8M-14,-4D10R22E2F2
R8E4F4R4E4U4M-11,-23U4E4U44H12":
PAINT(156,102),4,4:PAINT(66,106)
,4,4:DRAWB$:DRAW"BD2NF20M-12,-3D
2L2NU2D2L2D2M-4,+6G4L4D4R5NU2D10
L2D12R2D8F4R4D4L4U4M-8,+18F8"
518 DRAW"R4E6H4NU4F8R2F2R4M-4,-2
2R2M+10,+36R4M-12,-36RM+16,+36BL
12M-4,-16D2L2D14L2NU14L2U2BU4U4M
-12,-6G2M+12,+6M-2,-1M-4,+8DL12U
L2NR14UL2NR16UNR16UNR16UR4BR8M+2
,-6BU26BR22ND6":DRAWR$:DRAW"L22U
R22UNL22":DRAWB$:DRAW"R4M-3,-10M
+16,-12U2H8G8H6ND6NG4"
520 DRAW"F6D4E2NH2G12F4RE4":PAIN
T(160,138),R,B:DRAWR$:DRAW"BG4L8
BU2R6BU2L4BD6R6BD2":DRAWB$:DRAW"
R2BL2L8DNR8ND4R4D4":DRAWR$:DRAW"
BL10M-6,-48NU2L2M+6,+48":DRAWB$:
DRAW"BR5BU30D10L2NH2R4E2U2H2L4H2
U2E2R4F2BU28BL10U4H2ND6H4L2M-6,+
3"
522 DRAW"L6H2M-8,+3UM+8,-3U4E2R1
2F2D4BL16BD4G2D4L2DL2D4R2UR2D10F
2R2":PAINT(134,84),R,B:PMODE4:FO
RI=120TO140STEP4:FORY=80TO108STE
P2:PSET(I+OF,Y,1):PSET(I+OF+2,Y+
2,1):NEXTY:NEXTI
524 PMODE3:DRAWR$:DRAW"BR14U8R2N
D8":DRAWB$:DRAW"BU2BL10G4L4U2R4B
U4NL4E2BU2BLUBL4DBU10F4":PAINT(1
30,80),B,B:DRAW"BD36D4M-12,+4U4M
+12,-4M-12,+4H2L10D4M+12,+2M-12,
-6L10H2L2H2L2H6NH4M-8,+4NH4F12R1
6E4BU8BL14U10"
526 DRAW"L4M-8,-2M-6,-12L4U4R4M+
2,-6R4F4R4E2R2E2NR6D10R4D4L2D6G4
":PAINT(84,104),R,B:PMODE4:FORI=
70TO100STEP4:FORY=80TO108STEP2:P
SET(I+OF,Y,1):PSET(I+2+OF,Y+2,1)
:NEXTY:NEXTI:PMODE3:DRAWB$:DRAW"
BU24U4L2H2L2U2L4D2M-8,+3D2R4F4"
528 PAINT(82,124),R,B:PAINT(84,8
2),B,B:DRAW"BR2BD10D4F2R2E4BU2BR
2L4H2BU2UBR4DBL16BD4G6LM-20,+34D
4F2R22UR2UR2U6E2U4E2BL4":DRAWR$:
DRAW"G2D4G2D6L2U6E2U4E2NU5R2U4BU
6BR8U4E2U2L2D2G2ND2BE8BR4BU4":DR
AWB$:DRAW"R6E2U8NL8R18BD6BLM-16,
+3"
530 PAINT(110,96),R,B:PAINT(122,
```

★ COLOR COMPUTER DATA BASE MANAGER ★

# Elite•File™

*THIS IS IT! ELITE•FILE is the full featured, all machine language, Data Base Manager, that Color Computer users have been waiting for. From the same author that brought you ELITE•CALC, ELITE•FILE is for everyone who needs to store and recall information. You specify what to store, and what to retrieve. ELITE•FILE gives you total flexibility. ELITE•FILE is a relational Data Base Manager with all the editing and repeat formatting features that are typically found only on much larger computer systems, but priced for Color Computer users. It's "user friendly" command structure makes it simple to use even for those who don't write computer programs. ELITE•FILE is waiting to work for you.*

Features include:

- Compatible with ELITE•CALC and ELITE•WORD ASCII files
- User friendly combination of Menu driven input and single key commands
- Up to 255 named fields per record
- Up to 255 characters per field
- Up to 2000 characters per record
- Up to 4000 records per file
- Supports multiple drives
- Nested subfield definitions
- Up to eight fields in primary key
- Copy record definition from file to file
- View record definition
- Input records with easy to use field name format display
- Edit records with full screen "type over" editor
- Copy records to repeat identical data
- Scan mode for quick data retrieval
- Locate any record by field contents
- Load ELITE•CALC spread sheets into random access data files
- User setable print formats
- TAB, VTAB, CR, PAGE, text, hex print controls
- Join up to four subfile records to extend data record for print
- Create "Variable Text Insert" files for ELITE•WORD
- Produce repetitive reports with Retrieval Programs written on ELITE•WORD
- Refile data into new record structures

★ ALL MACHINE LANGUAGE
★ FLEXIBLE, USER DEFINED DATA RECORD STRUCTURES
★ 16 FILES CAN BE HANDLED AT THE SAME TIME FOR 64K RECORD CAPACITY!
★ EDIT, SCAN, SORT, SELECT RECORDS
★ OUTPUT REPORTS TO SCREEN, PRINTER, OR ASCII DISK FILE
★ PLACE DATA BY FIELD NAME, WITH CUSTOM TEXT, ANYWHERE ON THE PRINTED PAGE
★ COMPATIBLE WITH ALL PRINTERS
★ COMPREHENSIVE MANUAL
★ HANDSOME VINYL BINDER

THE BEST FOR ONLY

**$74⁵⁰**

- Disk Only
- Shipping NOW
- Add $2.50 Shipping
- PA residents add 6% sales tax
- Dealer inquiries invited

- Thousands of applications:
  - —Mailing List
  - —Inventory
  - —Record Collection Index
  - —Phone Number Reference
  - —Order Entry/Invoice
  - —Expense Records
  - —Recipe Files
  - —Study Note Retrieval
  - —Customer Files
  - —Check Book Register
  - —Library Catalog
  - —Appointment Calendar
  - —Yours
- Data, field definitions, indices stored on a single file
- List disk directories, change default drive and "kill" files without leaving ELITE•FILE
- Memory resident, no program overlays from disk
- Minimum 32K, Disk Basic required
- Single program performs all features
- Data files accessible from BASIC programs
- Project any subset of fields in any order for the printed output
- Select specific records by field content with full logic combination capabilities
- Sort records in ascending or descending order by any field
- Calculate values from combinations of field contents
- Math operators: +, —, *, /, ( )
- Display or print column totals

MasterCard VISA

see us at RAINBOWfest CHICAGO

**Elite Software**

Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

*From the creators of: ZAKSUND • COLOR TEXTSET I • COLOR TEXTSET II • INTER GALACTIC FORCE • TEXT EDITOR • PARTY PAK • COLOR MONITOR • TREK-16 • WARKINGS • DISK & TAPE COPY • ANIMALS • BODY PARTS • TAPE COPY and many other fine programs*

```
126),R,B:DRAW"BG20BL6L10R4NG4BE4
H4R2U2F4BD28G2L8":DRAWR$:DRAW"L1
2":DRAWB$:DRAW"D4NH2DF2L2H4F2G2M
+6,+14F2D4F2R8M+4,-20BU8BR4M+2,+
10D4M-3,+10G2L4D6L4NU4L4NU4D4R2N
U4R2NU4R2NU4U2R2NU2R4UNL4NU6R2NU
4D2R2NU6R2NU6R2NU6"
532 DRAW"R2NU4R2NU4R2NU4"
534 DRAW"BM140,58C4R50U20L12D4 L
26U4L10BL70BD2L22D10R2D8R2D6":PA
INT(58,50),4,4:PAINT(168,56),4,4
536 DRAWR$:DRAW"BM54,42M+4,+20 R
2M-4,-20RM+4,+20M+4,-20RM-4,+20M
+4,-20M+4,+18R2M-4,-18M+4,+18M+4
,-20R2M-4,+20BR6BU2M+2,-10R2M-2,
+10BR6BU2M+2,-10R2M-2,+10M+2,-10
D4NE4R2E4NR2DR2M-2,+8R2M+2,-8BD8
BR4U2R2D2L2BU6NU8R2NU8BD6BR10"
538 DRAW"NU18R2U18L10UR20DL10BD1
8BR6M-2,-10R2M+2,+10U6NE2R2E2NUN
F2R2F2D6M+2,-10R2M-2,+10BR8NU9R2
NU9BR6NU9R2U9D4NE2R2E4NR2DR2ND8R
2D8BR6R6U4L6U4R6DL6D2R6L2D4L4BR1
2BDU2R2D2BU6NU10LU10"
540 FORI=0TO62STEP62:CIRCLE(84+I
,40),4,R:NEXT:DRAWR$:DRAW"BM66,1
02M-4,-10L2U10R2U10R2U4R2U4BR40B
U4F2R2F2R4D2M+30,+7F4R2F4":DRAWB
$:DRAW"BM110,134L6BD":FORI=0TO12
STEP6:CIRCLE(100,150+I),20,B,.7,
.6,.9:NEXT
542 DRAW"BR6BD2D18L4U18NR4BL6BU2
D18L4U18NR4BL6BD2D18L4U18R4BD24"
:FORI=1TO5:DRAW"R6BU4R6BD6R8BD6B
L18":NEXT
544 X$=INKEY$:IFX$=CHR$(13)THENR
UNELSE544
```

230....... 99
450....... 23
680...... 181
END .... 140

Listing 2:

```
10 '******************************
20 '* TEXT SCREENQUIZ PROGRAM *
30 '*BY FRED B.SCERBO (C)1984 *
40 '* 149 BARBOUR ST.N.ADAMS   *
50 '*ILLUSTRATED MEMORY BANKS *
```

HARDWARE FOR YOUR CO-CO

KEYBOARDS

HJL MICRONIX

$79.95

C. Itoh Prowriter
8510 $399.
PROWRITER

WICO
Atari to CO-CO Adapter $17.95

PBH CORDLESS JOYSTICK
$99.

PBH JOYSTICK
$49.95

DRIVE 0 $379.
DRIVE 1 $229.

see us at RAINBOWfest CHICAGO

TANDON DISK DRIVES

Perfect for replacement or add on drive for any 5" drive system.

| | |
|---|---|
| TM100-1 40 Track Single Sided | $179. |
| TM100-2 40 Track Double Sided | $279. |
| TM50-1 6ms trk-trk Single Sided Thinline | $169. |
| TM50-2 6ms trk-trk Double Sided Thinline | $219. |
| Single case with extenders with drive above | $49.95 |
| Dual case with extenders for drives above | $79.95 |
| Two Drive Cable | $24.95 |

NEW! HARD DRIVE SPECIALIST

HARD DRIVE SPECIALIST

COCO HARD DRIVE COMING SOON!

a Serial/Parallel Interface for the **Radio Shack**™ Color Computer. Our Interface allows your **CoCo** to connect with most, currently manufactured, printers and offers such features as:

☐ Switch selectable baud rates from 300 to 9600.
☐ Switch selectable printer or modem operations.
☐ Elimination of recableing. It comes cabled with standard **"DIN"** connectors for **CoCo** and Modem. Also **"Centronics"** standard 36 pin connector for printers.
☐ Self contained Power Supply and Cord.

**Radio Shack**™ [illegible] **Tandy Corp.**

TO PRINTER
TO MODEM
TO POWER
TO COMPUTER
pbh
CoCo Serial/Parallel Interface
MODEM OFF PRINTER

$74.95

64K COCO KIT $62.95

Verbatim Datalife
SS/DD $25.95
Datalife minidisks Verbatim

NEW! Verex SS/DD $19.95

COMPUKIT CORPORATION

orderline
1-800-231-6671

local orders and shipping info
1-713-480-6000

16206D Hickory Knoll Houston, Texas 77059

```
60 '*****************************
70 CLEAR3000
80 SW=76
90 PL=58
100 SW=38:PL=36:TL=8:LL=21
110 CLS0
120 DIMAO(50),A$(50),B$(50),NP(5
0)
130 CLS0:GOTO200
140 IF LEN(JK$)<=SW THEN180
150 FOR T=SW TO 0STEP-1:IF MID$(
JK$,T,1)=" "THEN170
160 NEXT T:GOTO180
170 L$=LEFT$(JK$,T):W$=L$:GOSUB1
90:JK$="          "+RIGHT$(JK$,(LEN(J
K$))-T):GOTO140
180 W$=JK$:RETURN
190 PRINT#-2,W$:CR=CR+1:GOSUB690
:RETURN
200 FORJ=1TO50:READ A$(J),B$(J):
IF A$(J)="END" THEN220
210 NEXTJ:GOTO230
220 FORI=32TO95:PRINT@I,CHR$(223
);:NEXT
230 PRINT:PRINTTAB(3)"MULTIPLE C
HOICE TEST MAKER":PRINT
240 PT$=B$(J)
250 PRINTTAB(14)"BY":PRINTTAB(8)
"FRED B. SCERBO":PRINTTAB(6)"COP
YRIGHT (C) 1983"
260 PRINT:PRINT"WANT TO REVERSE
THE DATA (Y/N) ?"
270 FORI=384TO447:PRINT@I,CHR$(2
23);:NEXTI
280 T$=INKEY$:UH=RND(6666):IF T$
="N"THEN 320
290 IF T$="Y" THEN310
300 GOTO280
310 CLS0:FOR Q=1 TO J-1:TEM$=A$(
Q):A$(Q)=B$(Q):B$(Q)=TEM$:NEXT Q
320 CLS0:J=J-1
330 FORI=1 TO J
340 AO(I)=RND(J)
350 IF NP(AO(I))=1 THEN 340
360 NP(AO(I))=1:NEXTI
370 CLS:PRINT@128,STRING$(32,"*"
);:PRINT"SELECT (L)ARGE OR (S)MA
LL PRINT":PRINTSTRING$(32,"*");
380 P$=INKEY$:IF P$=""THEN380
390 IF P$="L"THEN 420
400 IF P$="S"THEN 430
410 GOTO380
420 SW=38:PL=37:TL=8:LL=21:PS=31
:GOTO440
430 SW=76:PL=66:TL=14:LL=53:PS=3
0
```

**DSKMON**

Examine and fix sector data, also includes disk read, write, file information display, and selective disk backup.
**(ML, 16k or 32k)**
**Disk (With Source)** .......... **$24.95**

**UNLOCK**

Color Computer Disk Fix Program. Complete disk fix utility. Features included are initialize any track (up to track 255), copy any track (up to track 255), verification of any track, and copy of any track fixing I/O errors.
**Disk** .................... **$24.95**

**EUCHRE**

A Hi-Res version of the card game. Your partner is the computer, the opponent team is played by the computer. Allows any of the four players to "GO" alone.
**(ECB, 32k)**
**Cassette** .................. **$19.95**

**CCADS**

A full 6809 machine language monitor with line assembler and disassembler. All you need to debug machine language programs.
**(ML, 16k or 32k) Cassette $19.95**
**or Disk (With Source)** ...... **$23.95**

**CLOCK**

A software real-time clock program for the CoCo. Warning: The clock will stop during tape I/O.
**(ML, 16k or 32k) Cassette $9.95**
**or Disk (With Source)** .......... **$13.95**

**BULLETIN BOARD SOFTWARE**

Run a Bulletin Board from your color computer. Includes upload and download of Ascii files. Requires 1 disk drive, 32k of memory and an auto answer modem.
**Includes schematics to make modem I auto-answer** .......... **$19.95**

**CHROMA-KEYS**

Define function keys and save them to disk or cassette.
**(ML, 16k or 32k) Cassette $9.95**
**or Disk (With Source)** .......... **$13.95**

**DARKROOM DATABASE**

Throw away your Photo-Lab index. Let CoCo look up the facts. Darkroom Data-Base with timer.
**(16k or 32k) Disk** .............. **$19.95**

**GRADES**

A data base program designed to aid in keeping records of students' test scores. Also calculates final grade, test averages, and other statistics.
**(32k) Cassette $19.95**
**or Disk (With Source)** .......... **$24.95**

**SPOOLER**

Print ASCII files from disk without waiting.
**(ML, 64k only)**
**Disk (With Source)** ........... **$15.95**

**COMMAND**

Add machine language programs as commands to BASIC.
**(ML, 16k or 32k) Cassette $15.95**
**or Disk (With Source)** .......... **$19.95**

C-S
**CHROMA-SYSTEMS GROUP**
P.O. BOX 366 • DAYTON, OHIO • 45420
Please include $1 for shipping & handling per item. Ohio residents please add 6% sales tax.

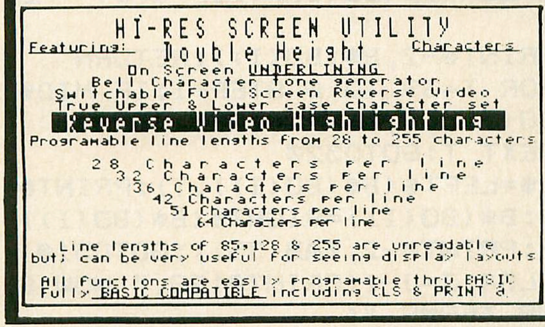
```
440 PRINT:PRINTSTRING$(32,"*");:
PRINT"PRESS <ENTER> TO BEGIN PRI
NTING":PRINTSTRING$(32,"*");
450 P$=INKEY$:IF P$=CHR$(13)THEN
470
460 GOTO450
470 PRINT#-2,CHR$(PS);" NAME";ST
RING$(LL,&H5F);"DATE";STRING$(TL
,&H5F)
480 PRINT#-2," TEST ON: ";PT$:PR
INT#-2," ":CR=4
490 FOR P=1 TO J
500 IF P<10 THEN ID$=" "ELSE ID$
=""
510 PRINT:JK$=ID$+STR$(P)+". "+A
$(AO(P))+" "+STRING$(6,&H5F)+"
":GOSUB140
520 FOR Q=1TO4
530 C(Q)=RND(J):IF C(Q)=AO(P) TH
EN530
540 FOR K=Q-1 TO 0STEP-1:IF C(K)
=C(Q) THEN530
550 NEXTK
560 NEXTQ:C(5)=AO(P)
570 FOR E=1TO5
580 F(E)=RND(5)
590 FOR K=E-1 TO 0 STEP-1:IF F(K
)=F(E) THEN580
600 NEXTK:NEXTE
610 PRINT
620 JK$=JK$+" (1) "+B$(C(F(1))):
GOSUB140
630 JK$=JK$+" (2) "+B$(C(F(2))):
GOSUB140
640 JK$=JK$+" (3) "+B$(C(F(3))):
GOSUB140
650 JK$=JK$+" (4) "+B$(C(F(4))):
GOSUB140
660 JK$=JK$+" (5) NOT GIVEN":GOS
UB140
670 PRINT#-2,JK$:GOSUB690
680 PRINT#-2," ":GOSUB690:NEXTP:
RUN
690 IF CR<=PL THEN RETURN
700 CLS:PRINT:PRINTSTRING$(32,"*
");:PRINTTAB(2)"ADVANCE PAPER TO
 NEXT SHEET":PRINTTAB(3)"PRESS <
ENTER> TO CONTINUE"
710 PRINT" PRESS (N) FOR NEXT L
INE ONLY":PRINTSTRING$(32,"*");
720 P$=INKEY$:IF P$=CHR$(13) THE
N CR=0:RETURN
730 IF P$="N" THEN RETURN
740 GOTO720
990 REM ENTER DATA AT LINE 1000
1000 DATA WHAT IS THE NAME OF TH
E LANGUAGE IN OUR COLOR COMPUTER
 ?,BASIC
1010 DATA WHICH COMMAND WILL CLE
AR THE SCREEN FOR US ?,CLS
1020 DATA WHICH COMMAND WILL PIC
K A RANDOM NUMBER FROM ONE TO TE
N ?,RND(10)
1030 DATA WHICH COMMAND WILL PIC
K A RANDOM NUMBER FROM ONE TO FI
FTY ?,RND(50)
1040 DATA WHICH COMMAND WILL PIC
K A RANDOM NUMBER FROM ONE TO ON
E HUNDRED ?,RND(100)
1050 DATA WHICH COMMAND WILL STA
RT A COUNTING LOOP ?,FOR
1060 DATA WHICH COMMAND WILL END
 A COUNTING LOOP ?,NEXT
1070 DATA WHICH COMMAND WILL SEN
D THE PROGRAM TO A SUBROUTINE ?,
GOSUB
1080 DATA WHICH COMMAND WILL SHO
W US THE PROGRAM WHICH WE HAVE T
YPED INTO OUR MEMORY ?,LIST
1090 DATA WHAT DO WE CALL A LETT
ER WHICH STANDS FOR A NUMBER OR
A STRING ?,VARIABLE
1100 DATA END,SAMPLE SCREEN QUIZ
```

```
190....... 60
360...... 137
530...... 140
END .... 160
```

Listing 3:

```
10 '******************************
20 '*   THE SUPERQUIZMAKER       *
30 '* BY FRED B.SCERBO (C)1984*
40 '*149 BARBOUR ST.N.ADAMS.MA*
50 '******************************
60 CLEAR3000:DIM AO(50),BO(50),A
$(50),B$(50),Z(50)
70 CLS4
80 FORJ=1TO50
90 READ A$(J),B$(J):IF A$(J)="EN
D" THEN110
100 NEXTJ
110 CLS4
120 PRINT@68,"  THE SUPER QUIZMA
KER   ";
130 PRINT@100,"    BY FRED B. SCE
RBO    ";
140 PRINT@164," A) PRINT ALL TER
MS    ";
150 PRINT@196," B) MATCHING QUIZ
     ";
160 PRINT@228," C) FILL-IN TERMS
     ";
170 PRINT@260," D) FILL-IN DEFIN
ITION  ";
```

# HI — RESOLUTION SCREEN UTILITY



```
HI-RES SCREEN UTILITY
Featuring:   Double Height   Characters
         On Screen UNDERLINING
      Bell Character tone generator
  Switchable Full Screen Reverse Video
  True Upper & Lower case character set
   Reverse Video Highlighting
Programable line lengths from 28 to 255 characters

      28 Characters per line
       32 Characters per line
        36 Characters per line
         42 Characters per line
          51 Characters per line
           64 Characters per line

   Line lengths of 85,128 & 255 are unreadable
but; can be very useful for seeing display layouts

  All functions are easily programable thru BASIC
  Fully BASIC COMPATIBLE including CLS & PRINT @
```

- FULLY BASIC COMPATIBLE
- DISPLAY FORMATS OF 28 to 255 CHARACTERS PER LINE
- FULL 96 UPPER LOWER CASE CHARACTERS
- MIXED GRAPHICS & TEXT OR SEPARATE GRAPHIC & TEXT SCREENS
- INDIVIDUAL CHARACTER HIGHLIGHTING
- REVERSE CHARACTER HIGHLIGHT MODE
- WRITTEN IN FAST MACHINE LANGUAGE
- AUTOMATIC RELOCATES TO TOP OF 16 32K
- AUTOMATICALLY SUPPORTS 64K of RAM WITH RESET CONTROL
- REVERSE SCREEN
- ON SCREEN UNDERLINE

- DOUBLE SIZE CHARACTERS
- ERASE TO END OF LINE
- ERASE TO END OF SCREEN
- HOME CURSOR
- BELL TONE CHARACTER
- HOME CURSOR & CLEAR SCREEN
- REQUIRES ONLY 2K OF RAM
- COMPATIBLE WITH ALL TAPE & DISK SYSTEMS

**$19.95**

Display Formats 28 to 255 x 24

## INTRODUCING

# TEXTPRO III

## "The Professionals" Word Processing System

64K Support

- **9 Hi-Resolution Display Formats: from 28 to 255 Columns by 24 lines**
- **True Upper/Lower Case Display**
- **Three Programmable Headers**
- **Programmable Footer**
- **Automatic Footnote System**
- **Automatic Memory Sense 16-64K**
- **Up to 48K of Workspace on 64K**
- **10 Programmable Tab Stops**
- **7 Tab Function Commands**
- **Automatic Justification**
- **On Screen Underlining and Double Size Characters**
- **Change Formatting at Any Time**
- **Edit Files Larger Than Memory**
- **Compatible with All Printers**
- **Easily Imbed Any Number of Format and Control Codes**
- **Typist Friendly Line and Command Format Entry**
- **Automatic Key Repeat**

TEXTPRO III is the most advanced Text Editing and Word Processing System available for the Color Computer. One of the reasons for this is, Textpro works in a totally different way than the other Color Computer Word Processing programs. It uses simple 2 character abbreviations of words or phrases for commands. These commands are used at the beginning of a line and are preceeded by a "." period. Several commands can be chained together on the same line for ease of use. Thru these commands you tell the Word Processor how you want the margins set, line length, indenting information, and so on. You can change the way you want a document formatted at any point in the document. You also have the freedom to write without worrying about how long the line is or where the margins are and so on. The Word Processor automatically takes words from one line to the next and fills out the printed line to the desired length. You can even use the command to Input Text from the Keyboard while a document is being processed, and use that information to change the formatting or enter any other valid text Processor command. With this kind of flexibility and an extensive set of commands and functions available, its no wonder that TEXTPRO III is the most advanced Word Processing System.

### Screen Formatting

Textpro III has 9 Hi-Resolution Upper/Lower case display formats available, from 28 to 255 characters per line by 24 lines. You also have advanced screen commands such as double size characters and on screen underlining. You can also use the standard 32 by 16 display for systems having lower case hardware kits installed. The display defaults to a 51 by 24 format that is easily switched to any other format available. Along with the Hi-Resolution screen we added automatic repeating keys "Typomatic." The rate is fully adjustable from ultra fast to super slow or can be turned off entirely for your convenience.

### 64K Support

Textpro III fully supports the use of 64K on the Color Computer. It has fast automatic memory sensing and configures itself accordingly. Textpro III does not require Extended Basic or Flex to take full advantage of a 64K RAM system. On a 64K Disk System there is over 64K of workspace available and files larger than memory are fully supported. Tape based systems have up to 48K available for workspace.

### Text Editor

Textpro III has a full featured, line oriented screen editor. It supports single or multiple line copy and move, global or local search and replace of any character string, character insert and delete, block delete, adjustable speed automatic key repeat, single and automatic line edit, programmable underline and double width control coded, change screen background color and line lengths, automatic line numbering, line resequencer, and insert and delete line numbers.

### Disk & Tape I/O

Textpro III uses fully compatible ASCII formatted files that do not have to be converted like some of the other Word Processing Systems. It will load, save and verify basic ASCII formatted tape files. The disk version supports Load, Save, Directory, Kill, Append, Text Process file from Disk, Roll part of file to disk and get next portion of file from disk.

**DISK $59.95** **TAPE $49.95**

### Standard Commands

Textpro III features a whole host of Document Formatting commands. The setup command section includes: Line Length, Top, Left, and Bottom Margins, Page Length, Page Numbering on/off and Automatic Word Fill and Justification on/off.

Some of the vertical control features include: test for number of lines left on the page, skip to next page, set page number, wait at top of page, single and multi line spacing, and skip blank lines.

Textpro III features 3 programmable header lines that can be centered, left or right justified. It also has one programmable footer line. 3 commands for continues, single and paragraph indenting, center text, underline and double width print commands.

### Footnotes and Special Commands

Some of the special features allow imbedded control codes to access intelligent printer features like; superscript, subscript, change type font and even graphics. You can even imbed control codes within justified text. There is a command that automatically places footnotes at the bottom of the page, which can be very handy for term papers, etc. Another command allows you to display a message on the screen and input text from the keyboard. This text is then printed as if it has been part of the original text, thus you can produce things like a personalized form letter. There is also a repeat command that allows you to repeat an entire document or a part of one as many times as needed up to 255 times. This can be used to produce mailing labels or combined with the previous command to produce a selected number of personalized form letters.

### Tab Functions

Textpro III features an elaborate system of tab commands for complete control over column formatting. There are 10 programmable tab stops that can be defined or re-defined at any time in the text file. They can be used with the following tab commands; Center Over Tab Column, Right Justify to Tab Column, Decimal Align Over Tab Column, Left Justify to Tab Column (Normal Tab) and Horizontal Tab. Tab functions may also be used with a numeric tab column position for maximum flexibility. You can also define the Tab Fill Character to any printable character to fill in the blanks with dots, dashes, etc.

**5566 Ricochet Avenue**
**Las Vegas, Nevada 89110**

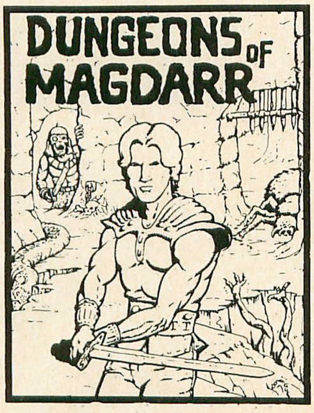
CER COMP
**(702) 452-0632**

All Orders Shipped From Stock
Add $2.50 Postage

```
180 PRINT@292," E) EXIT PROGRAM
    ";
190 X$=INKEY$:MU=RND(-TIMER):IFX
$=""THEN190
200 IF X$="A"THENGOSUB560:GOTO27
0
210 IF X$="B"THENGOSUB560:GOTO31
0
220 IF X$="C"THENGOSUB560:GOTO38
0
230 IF X$="D"THENGOSUB560:GOTO46
0
240 IF X$="E"THEN CLS:END
250 GOTO190
260 PRINT#-2,"  NAME";STRING$(51
,&H5F);"DATE";STRING$(13,&H5F):P
RINT#-2," ":PRINT#-2,"     ";B$(J+
1):PRINT#-2," ":RETURN
270 PRINT#-2,"     TERMS FOR REVI
EW":PRINT#-2," ":PRINT#-2,"     "
;B$(J+1):PRINT#-2," "
280 FOR I=1TOJ:I$=STR$(I)+".":IF
 I<=9 THEN I$=" "+I$
290 PRINT#-2,TAB(2);I$;"  ";A$(I
);TAB(32);" - ";:BO(I)=I:GOSUB51
0
300 PRINT#-2," ":NEXT I:RUN
310 GOSUB260
320 PRINT#-2,"  MATCH THE TERM O
N THE LEFT WITH THE CORRECT TERM
 ON THE RIGHT.":PRINT#-2," "
330 FORI=1 TO J
340 I$=STR$(I)+".":IF I<=9 THEN
I$=" "+I$
350 PRINT#-2,TAB(2);I$;"  ";A$(A
O(I));TAB(28);STRING$(4,&H5F);CH
R$(64+I);". ";:GOSUB510
360 PRINT#-2," ":NEXTI
370 RUN
380 GOSUB260
390 PRINT#-2,"  FILL IN THE TERM
 WHICH CORRESPONDS TO THE DEFINI
TION ON THE RIGHT.":PRINT#-2," "
:PRINT#-2," "
400 FOR I=1 TO J
410 I$=STR$(I)+".":IF I<=9 THEN
I$=" "+I$
420 PRINT#-2,TAB(2);I$;STRING$(2
6,&H5F);TAB(35);
430 GOSUB510
440 PRINT#-2," "
450 NEXTI:RUN
460 GOSUB260
470 PRINT#-2,"  WRITE THE CORREC
T DEFINITION FOR THE TERMS LISTE
D BELOW.":PRINT#-2," ":PRINT#-2,
" "
480 FOR I=1 TO J
490 I$=STR$(I)+".":IF I<=9 THEN
I$=I$+" "
500 PRINT#-2,TAB(2);I$;"  ";A$(A
O(I));TAB(28);STRING$(45,&H5F):P
RINT#-2," ":NEXTI:RUN
510 Q=LEN(B$(BO(I))):IF Q>39 THE
N 530
520 PRINT#-2,B$(BO(I)):RETURN
530 FOR T=39 TO 0 STEP-1:IF MID$
(B$(BO(I)),T,1)=" "THEN 550
540 NEXT T:GOTO520
550 L$=LEFT$(B$(BO(I)),T):PRINT#
-2,L$:B$(BO(I))=RIGHT$(B$(BO(I))
,Q-T):PRINT#-2,TAB(35);:GOTO510
560 CLS4:J=J-1:PRINT@198," NOW S
ORTING TERMS ";
570 FORI=1 TO J
580 AO(I)=RND(J)
590 IF Z(AO(I))=1 THEN 580
600 Z(AO(I))=1
610 PRINT@203,"SORTING";:PRINT@2
03,"SORTING";:NEXTI
620 FORI=1 TO J
630 BO(I)=RND(J)
640 IF Z(BO(I))=0 THEN 630
650 Z(BO(I))=0
660 PRINT@203,"SORTING";:PRINT@2
03,"SORTING";:NEXTI
670 CLS6:PRINT@199," NOW PRINTIN
G QUIZ ";:RETURN
1000 DATA GERMS,THESE GO INTO TH
E AIR WHEN PEOPLE COUGH AND SNEE
ZE
1010 DATA VIRUSES,CAN GROW AND D
IVIDE ONLY WHEN THEY ARE INSIDE
LIVING CELLS
1020 DATA BACTERIA,TINY LIVING T
HINGS THAT HAVE ONLY ONE CELL EA
CH
1030 DATA MUCUS,STOPS MANY GERMS
 FROM GETTING INTO YOUR LUNGS AN
D STOMACH
1040 DATA ANTIBODIES,GERM FIGHTE
RS THAT KILL VIRUSES AND BACTERI
A
1050 DATA WHITE BLOOD CELLS, CAN
 EAT AND KILL BACTERIA BUT NOT V
IRUSES
1060 DATA POISONS,BACTERIA MAKES
 THESE AS THEY GROW AND DIVIDE
1070 DATA SKIN,THE BODY COVERING
 THAT KEEPS MANY GERMS OUT OF TH
E BODY
1080 CAVITY,THIS RESULTS WHEN BA
CTERIA GROWS ON YOUR TEETH
1090 MICROSCOPE,THIS IS NEEDED T
O SEE VIRUSES
5000 DATA END,GERMS
```

# AARDVARK LTD.

## VIDEO ADVENTURES™



**DUNGEONS OF MAGDARR** - Serious D of D for up to 8 players. Features full 3d GRAPHICS! You get a choice of several characters that grow from game to game and are interchangeable with characters from our famous Dungeons of Death game. A real dungeon with level after level of monsters to conquer and treasures to find - all in hi-res 3d graphics.

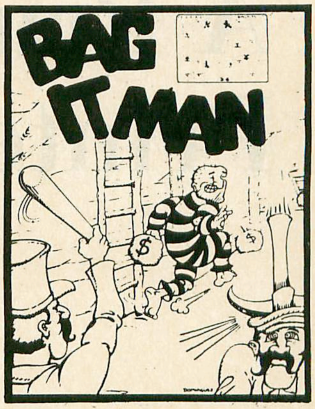
Available On: TRS80C, IBM PC, CMD64

TAPE $19.95 DISK $24.95

**BAG-IT-MAN** - The ultimate arcade game for TRS80C or CMD64. This one has three screens full of BAGS OF GOLD, CARTS & ELEVATORS TO RIDE IN, MINE SHAFTS, and TWO NASTY GUARDS. Great sound and color and continuous excitement.

Available On: TRS80C 32K, CMD64

TAPE $19.95 DISK $24.95



**QUEST** - A different kind of Graphic Adventure, it is played on a computer generated mape of Alesia. You'll have to build an army and feed them through combat, bargaining, exploration of ruins and temples, and outright banditry! Takes 2 - 5 hours to play and is different each time.

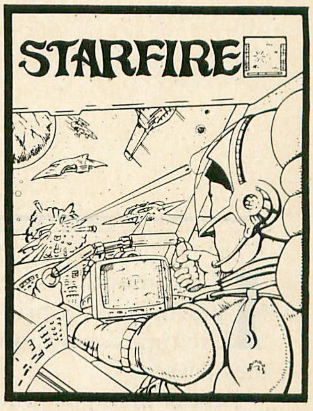
Available On: TRS80C 16K, CMD64, VIC20 13K, MC10 16K, TI99 (EXT. BASIC), IBMPC

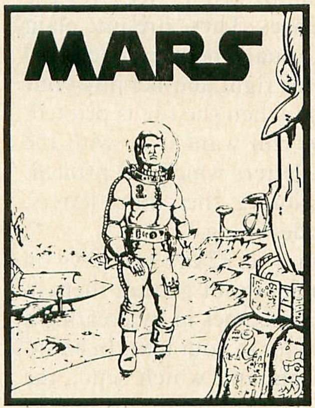
TAPE $14.95 DISK $19.95

**STARFIRE** - If you enjoyed StarRaiders or StarWars, you will love Starfire. It is not a copy, but the best shoot-em-up, see them in the window space game on the CMD64 or TRS80C. The fantastic graphics will put you right in the control room as you hyperspace from quadrant to quadrant fighting the aliens and protecting your bases.

Available On: TRS80C 16K, CMD64

TAPE $19.95 DISK $24.95





**MARS** - Your ship crashed on the Red Plane and you have to get home. You will have to explore a Martian City, repair your ship, and deal with possibly hostile aliens to get home again. This is recommended as a first Adventure. It is in no way simple - playing time normally runs from 30 to 50 hours, but it lets you try out Adventuring before you battle the really tough ones. Full Graphics Adventure.

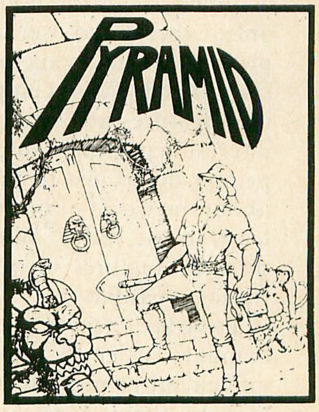
Available On: TRS80C, CMD 64, IBM PC

TAPE $19.95 DISK $24.95

**PYRAMID - ONE OF THE TOUGHEST ADVENTURES.** Average time through the pyramid is 50 - 70 hours. Clues are everywhere and some ingenious problems make this popular around the world. FULL GRAPHIC ADVENTURE.

Available On: TRS80C 16K, CMD64, MC10 16K, IBM PC

TAPE $19.95 DISK $24.95



## NEW! GRAPHIC ADVENTURES

**AARDVARK** offers over 120 original high quality programs. Send one dollar for a current catalog and receive a $1.00 gift certificate good towards your next purchase.

Authors - **AARDVARK** pays top dollar for high quality programs. Send a copy today for a personal review and editorial help.

**TO ORDER:** Send amount indicated plus $2.00 shipping, per order. Include quantity desired and your preference of tape or disk. Be sure to indicate type of system and amount of memory. When using charge card to order by mail, be sure to include expiration date.

MasterCard CHARGE CARDS WELCOME VISA **1-313-669-3110**

PHONE ORDERS ACCEPTED
8:00 a.m. to 8:00 p.m. E.S.T., MON-FRI

AARDVARK *Action Software*

2352 S. COMMERCE • WALLED LAKE, MI 48088 • (313) 669-3110

**CMD64 / TRS80C / IBMPC / VIC20 / TI99**

# A Primer On Printers — Part II

**By Tom Nelson**
**RAINBOW Contributing Editor**

In last month's issue we left our hero hanging from the precipice on a printer ribbon. We now return for the exciting conclusion of the story — after these short messages.

Printer manuals vary in the degree of sophistication assumed about the user. Almost all assume a knowledgeable, experienced user. They explain all the features of the printer without trying to distinguish what we need just to get started and without emphasizing what the most commonly used features are. Many also assume that the user has an interest in printing using BASIC. Yet, most people who buy a printer do so just to print. We don't know all that much about the world of printers, and many of us do not want to learn to use BASIC. What we want to do is implement the printer's features in our existing software with the least trouble possible.

To be fair to the printer companies, the task of making the manuals easier to use is very difficult. The methods to implement printer functions are as varied as the programs that use them. There is no way any printer manual could hope to cover them all, and so the authors revert to an assumed common denominator: BASIC. However, what this usually means is that most of us are stuck shuffling through the pages looking for some chart or other to help explain what we cannot, or what we refuse to learn with the extensive BASIC program examples in the manual. This is the tried and true hide and seek method of learning to use a printer.

Well, it doesn't have to be all that difficult. Before I get to discussing the control codes of a specific printer, let me first explain just how printer control codes are implemented in software. Since, in my prejudiced viewpoint, *VIP Writer* has some very flexible methods of inserting control codes, I'll use it to help explain.

As I said in last month's column, printer features are controlled by control code sequences. These are just plain old numbers in the ASCII system, usually between decimal 0 to 32. What you want to do is put the right number into your textfile at the correct place so that when the file is printed, your printer will react just when you want it to with the desired feature. Down march the letters which are printed, and then a number to start underlining, then more letters, and then a number to turn off underlining.

Since the ASCII symbols from 0 to 32 are not keys on your keyboard, just how do you go about getting them in your file? That's where the software comes in by creating a convenient method to put those codes in your text. In BASIC they are sent with the *CHR$* command which sends the decimal number after the command to the printer. Prepackaged software, however, is usually not written in BASIC, and even if it is, to use the *CHR$* command to implement control codes would not be "user friendly."

*VIP Writer* is a good example of how many systems let you put control codes in your text. *VIP Writer* allows you to do it in either of two ways, manually or automatically. *VIP Writer* allows all 128 standard ASCII characters to be generated from the keyboard. Every decimal equivalent may be generated with its own key sequence from the keyboard. By consulting an appendix in the manual, any user may find out how to put in any control code, press the keys, and there it is. That's the manual way to put control codes in your text.

*(Tom Nelson was formerly a special assistant attorney general for the State of Minnesota. He currently is general counsel for Softlaw Corporation, makers of the* VIP Library™ *and of* ColorQuest™ *games.)*

Another common way to put in control codes is automatically. Many programs allow you to create your own customized "printer driver." A printer driver is a series of control code sequences designed to work with a specific printer. With *VIP Writer* the user may create a printer driver with up to 10 control codes. This is done easily by having each control code sequence be equal to a character, from one through nine, and colon. For example, 1=27;45;1 would turn on underlining in an MX-80 printer. When you have all your control codes sequences you can save them out as your printer driver, to be loaded as the first thing in each file.

To automatically put control codes in your textfile using *VIP Writer*, you press the CLEAR key plus the corresponding letter, from one to nine or colon, that equals the desired control code sequence. The correct control codes are then inserted into your text file. The printer driver method has several advantages. First, you can create several of them for different uses, such as different letter formats. Second, if you have more than one printer, you can use each number for a similar function, setting the appropriate control codes in the printer driver for each printer. Third, since each number can be set with up to 10 codes, complex printer control sequences are more easily entered.

> *"Many programs allow you to create your own customized 'printer driver' A printer driver is a series of control code sequences designed to work with a specific printer."*

One more thing about putting control codes in text is worth noting. Many programs use special markers to set off printer control codes. This is done for one or more reasons. In word processors, neat, even, right and left margins are often desired. To accomplish this through software, the word processor must keep track of the number of characters on the line. If the control codes were not marked, they would be counted too, changing the character count and altering the neat margin.

*VIP Calc* also uses such markers, but for a different reason. Spreadsheet programs only print the portion of a cell's contents which fit in the column width. To allow control codes to be put anywhere in a cell and be sent to the printer even if it doesn't fit in the cell width, markers are used to set off control codes. This assures that all control codes in a cell will be sent to the printer no matter their location.

This is how control codes are implemented in the software you buy. The trick now is to get the printer codes in your printer manual into your text. Every printer manual has a printer control code summary somewhere. Some have several and some barely have one. If you want a quick survey of the features of the printer, this is the place to go.

Let's take a brief look at the control code summary of the popular Epson MX-80. (The control codes for the Epson are nearly identical to those for the Gemini series of printers as well.) The control code summary is contained in Appendix B of the manual. It lists two columns, one with the "ASCII #" and the other with the function. "ASCII #" refers to the decimal number of the control code. The control codes are listed in ascending numerical order.

The first control code is a zero. This control code is called a null, and in the Epson printer is used with other control codes to turn off certain features, notably underlining and superscripts.

Decimal 7 is the bell character. It is uniformly used in printers to sound a buzzer.

Decimal 8 is the universal backspace character. It is used to backspace the printhead on the same line. You might wish to use it to do such things as place a tilde over the previous letter.

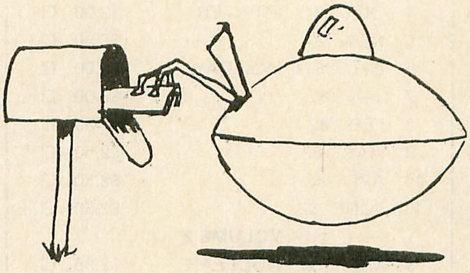
Decimal 10 is a linefeed character. Ten is used as the linefeed control code by most printers. When the printer gets this character, the paper is advanced on line.

Decimal 11 is a vertical tab. Well now just what is a vertical tab? It is a reverse linefeed, and it moves the paper back one line. Eleven is also commonly used by printers as the reverse linefeed control code.

Two other "universal" control codes are decimal 12 and 13. Twelve is the formfeed control code. When the printer receives this control code, it advances the paper to "top of form," or the top

The RAINBOW

Back Issue Availability



Back copies of many issues of *the Rainbow* are still available.

All back issues sell for the single issue cover price. In addition, there is a $3.50 charge for the first issue, plus 50 cents for each additional issue, for postage and handling if sent by United Parcel Service and $6 for orders sent U.S. Mail. UPS *will not* deliver to a post office box or to another country. This charge applies whether you want one back issue or all of them.

Issues July 1981 through June 1982 are available on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 5 percent state sales tax. We do not bill and no C.O.D. orders accepted.

Due to heavy demand, we suggest you order back issues you want now while supplies last.

To order, just fill out the form on the next page and mail it with your payment to:

*the RAINBOW*
9529 U.S. Highway 42
P.O. Box 209
Prospect, KY 40059

## BACK ISSUE ORDER FORM

☐ Please send me the following back issues:
**(Payment must accompany back issue orders.)**

| NO. | MONTH YEAR | | PRICE | |
|---|---|---|---|---|
| | **VOLUME 1** | | | |
| 1 | JULY '81 | PREMIER ISSUE | $2.00 | ☐ |
| 2 | AUG. '81 | | $2.00 | ☐ |
| 3 | SEPT. '81 | EDUCATION | $2.00 | ☐ |
| 4 | OCT. '81 | PRINTER | $2.00 | ☐ |
| 5 | NOV. '81 | | $2.00 | ☐ |
| 6 | DEC. '81 | HOLIDAY | $2.00 | ☐ |
| 7 | JAN. '82 | | $2.00 | ☐ |
| 8 | FEB. '82 | | $2.00 | ☐ |
| 9 | MAR. '82 | | $2.50 | ☐ |
| 10 | APR. '82 | | $2.50 | ☐ |
| 12 | JUNE '82 | | $2.50 | ☐ |
| | **VOLUME 2** | | | |
| 9 | MAR. '83 | NUCLEAR | $2.95 | ☐ |
| 10 | APR. '83 | SIMULATIONS | $2.95 | ☐ |
| 11 | JUNE '83 | PRINTERS | $2.95 | ☐ |
| 12 | JULY '83 | ANNIVERSARY | $2.95 | ☐ |
| | **VOLUME 3** | | | |
| 1 | AUG. '83 | GAMES | $2.95 | ☐ |
| 2 | SEPT. '83 | EDUCATION | $2.95 | ☐ |
| 3 | OCT. '83 | GRAPHICS | $3.95 | ☐ |
| 4 | NOV. '83 | DATA COMM. | $3.95 | ☐ |
| 5 | DEC. '83 | HOLIDAY | $3.95 | ☐ |
| 6 | JAN. '84 | BEGINNERS | $3.95 | ☐ |
| 7 | FEB. '84 | ADVENTURE | $3.95 | ☐ |
| 8 | MAR. '84 | BUSINESS | $3.95 | ☐ |
| 9 | APR. '84 | GAMING | $3.95 | ☐ |
| 10 | MAY '84 | PRINTER | $3.95 | ☐ |

TOTAL ________
SHIPPING & HANDLING
U.P.S. CHARGE ________
U.S. MAIL $6.00 ________
KY RESIDENTS ONLY
ADD 5% ________
**TOTAL AMOUNT ENCLOSED** ________

Name ________
Address ________
City ________ State ________ ZIP ________
☐ VISA ☐ MasterCard ☐
CARD # ________
EXPIRATION DATE ________ PHONE # ________

of the next page. Decimal 13 is a carriage return. When a printer receives a carriage return, it moves the print head, or carriage, to the beginning of the line. Some printers do more with a carriage return. It is common practice to treat a carriage return as a linefeed plus a carriage return. This causes the print head to go to the beginning of the line and the paper to advance one line. For printers that don't react like this the software must be made to add linefeeds after carriage returns.

Now come some control code pairs. Decimal 14 and 20 are used to turn double wide printing on and off. Decimal 15 and 18 turn the compressed character font on and off. These two fonts are pretty self-explanatory.

The next major code is decimal 27. This code is universally used as an escape code. The escape code tells the printer to look out for the next character sequence and treat it as a control code. The escape code was needed to give more than 32 possible control codes. With the escape code, regular alphabet letters can be used for control codes, so long as they follow an escape code.

Escape code sequences are used to a large extent by the MX-80. Escape E and F are used to turn the emphasized font on and off; escape G and H are used to turn the double strike font on and off. You should note that the letters which come after the escape code here must be capital letters, not lowercase letters. This is because uppercase and lowercase letters have different ASCII numeric equivalents.

You may notice that the italics font is turned off with escape 4 and 5. These numbers are the ASCII 4 and 5 on your keyboard, decimal 52 and 53. Be careful not to confuse the ASCII symbols with their numeric equivalents.

Escape sequences are not limited to the escape code plus one letter. Underlining is controlled by three character sequences: the escape code, a dash (45 decimal) and a number greater than 0 for on, or 0 for off. Superscripts and subscripts, controlled by the half-forward and half-reverse linefeeds, are also controlled by multiple character escape sequences: the escape code, an 'S' and then a number greater than 0 to turn on subscripts and a 0 to turn on superscripts.

This sampling explains some unfamiliar terms and control code practices. The control code summary contains many other printer features for more specialized uses. You are allowed to control virtually every aspect of how dots are printed on paper to form characters. Now to get your control codes into your text. In *VIP Writer*, the control codes may be dealt with manually or automatically. To manually insert control codes, the user would go to Appendix E of the manual, look for the decimal number of the control code, and then look to see how that control code is generated from the keyboard.

To do it automatically, a printer driver must be created. Here is a 10-code printer driver for the Epson MX-80 with the following functions: 1 emphasize on; 2 emphasize off; 3 underline on; 4 underline off; 5 double-wide on; 6 double-wide off; 7 compressed on; 8 compressed off; 9 superscript on; 10 subscript on.

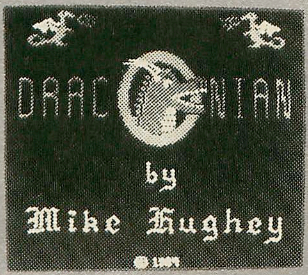
```
1=27;69,2=27;70,3=27;45;1,4=27;45;
0,5=14,6=20,7=15,8=18,9=27;83;0,:
=27;83;1
```

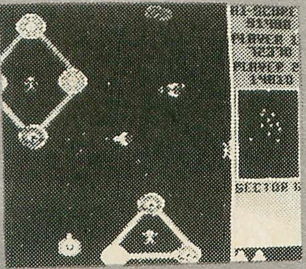
(Those with *VIP Writer* should remember to put this printer driver in a format line at the beginning of the textfile.)

Since we're here let's cover one more thing. Many printers offer special character sets for many characters not in the ASCII character set. These include German or French letters and the Japanese alphabet. These letters are usually printed when the printer is sent a decimal number over 128. For example, the Radio Shack DMP-200 printer will print a copyright symbol when it receives a decimal 171.

Numbers over 128 cause problems. After all, there are only so many characters on the keyboard, and only so many tolerable combinations of them to get the standard 128 characters. BASIC still uses the *CHR$* command to generate these numbers. Other software, however, usually uses a special method to get these numbers. *VIP Writer*, for example, allows you to "program" a character to equal the number. Then, when you generate the programmed character, the right decimal number will be sent to the printer. There are 10 of these in *VIP Writer* to give you as much flexibility as possible.

Well, that's a good beginning. Of course, there's a lot more to know about printers and printing. It will take a while to get used to your new printer. And it could take months for you to become familiar with all of its features. What's great is that the more you learn the more interesting it all becomes.





## DRACONIAN

You brace yourself as your ship materializes in the enemy sector. Your engine roars to life, and you consult the long-range scanner for the position of the nearest enemy base. As you head for the base, blasting asteroids and space-mines in your path, you suddenly notice a monstrous space-dragon looming before you. Reacting quickly, you dodge his deadly fire-breath and blast him out of existence.

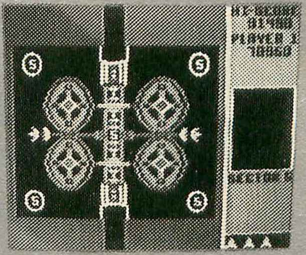
Finally, the enemy base comes into view. Avoiding the enemy fire, you destroy the gun turrets one by one with your rapid-fire torpedoes. Then, with the explosions still echoing around you, you rescue the astronaut who was being held prisoner by the enemy. Your mission is far from over, however, as there are more bases to destroy and more astronauts to rescue before the sector will be secured. And all must be done quickly; if you are too slow, the invincible DRACONIAN will surely seek you out as its next victim.

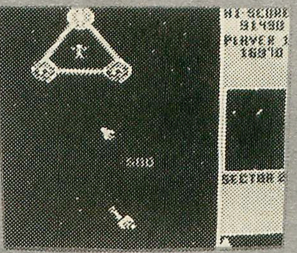
This is it — the single most impressive, awe-inspiring arcade game you can buy for your Color Computer. High-resolution graphics, awesome sound effects, four-voice music, and quality you have to see to believe! Experience the realism of DRACONIAN today!

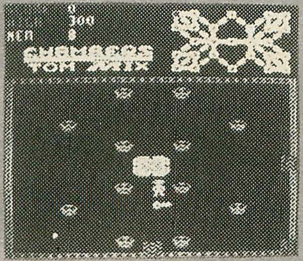
**JOYSTICKS REQUIRED**

**32K MACHINE LANGUAGE**

**TAPE $27.95** **DISK $30.95**







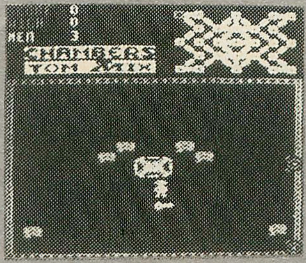
## CHAMBERS

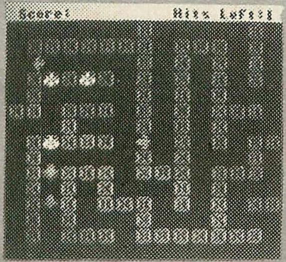
Exciting high resolution graphics game. Multiple screens. Outstanding sound, Chambers is loosely based on Cosmic Chasm. The object in each level is to destroy all of the evil creatures in each room and then go into the main reactor room and blow up the base.

**JOYSTICKS REQUIRED**

**32K MACHINE LANGUAGE**

**TAPE $24.95** **DISK $27.95**





## WAREHOUSE MUTANTS

Journey through the warehouse seeking out the Mutants who are out to destroy you. WATCH OUT! They will push crates trying to crush you! Outstanding realism—high resolution graphics—multiple screens.

**JOYSTICKS REQUIRED**

**16K MACH. LANGUAGE**

**TAPE $24.95**

**DISK $27.95**

## QUIX

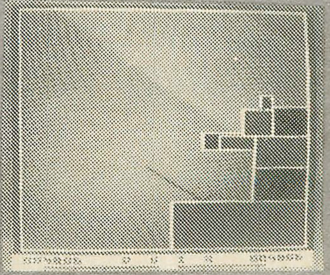
This one is after a popular arcade game with a similar name. Simply frustrating—you'll love it. Done in high resolution graphics with Super Sound.

**JOYSTICKS REQUIRED**

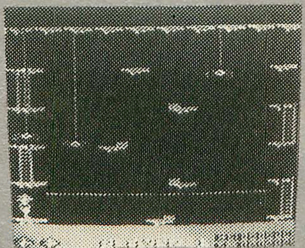
**32K MACH. LANGUAGE**

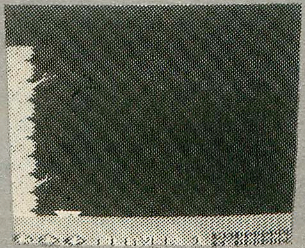
**TAPE $24.95**

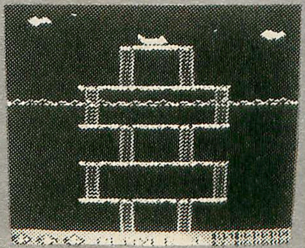
**DISK $27.95**



## CRASH







This game is a high resolution Machine Language program with outstanding Arcade type graphics. The game consists of 4 screens. Fly the airplane over and through obstacles. Piloted by "Mario" who also appeared in "The King". The object is to conquer one screen after another but don't "Crash". Great fun for the whole family. For 1 or 2 players. Uses joysticks.

**TAPE $24.95** **32K MACHINE LANGUAGE** **DISK $27.95**

see us at RAINBOWfest CHICAGO

**TOM MIX SOFTWARE**
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

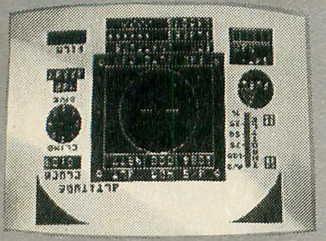
**•ADD $1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•**
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE

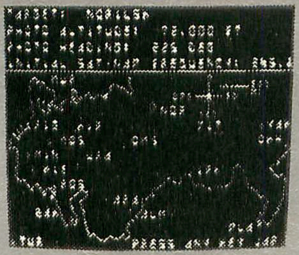
MasterCard

ARCADE ACTION GAMES

VISA

**TO ORDER CALL 616/957-0444**

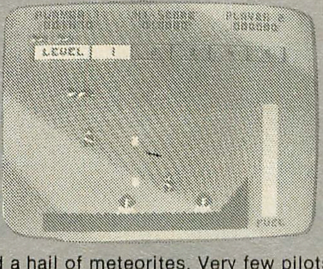




## SR-71

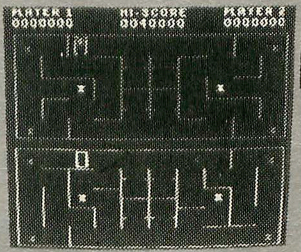
SR-71 is a fast action game in which you are the pilot on a mission to take photographs of missile sites in Russia and deliver them to our processing laboratory in Japan. So real you will feel as if you are in the cockpit on a real spy mission. Elude Russian missiles as well as their detection devices. Another Tom Mix exclusive. A must for the adventurous. Fantastic graphics, color and sound. **32K Ext. Basic** **TAPE $28.95** **DISK $31.95**

## SKRAMBLE



Your mission is to penetrate the enemy skramble system and destroy their headquarters. You will start with three of our latest spacefighters equipped with repeating cannon and twin bomb launcher. If you succeed in evading the elaborate ground defenses, you will arrive at the Cave where flying becomes more difficult. In the cave are UFOs, after which you must avoid a hail of meteorites. Very few pilots succeed this far, but if you do, then you must enter the Fortress, followed by the Maze. One or two player game. Machine Language, high speed, Arcade action. Full color graphics with sound. Keyboard or joystick control.

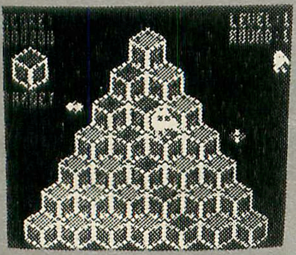
**16K MACHINE LANGUAGE** **TAPE $24.95** **DISK $27.95**



## GRABBER

A pac type game. Two complete mazes jump from one to the other. Probably the most outstanding sound you have ever heard. Arcade Action. Method of play, you are the Grabber. The object is to grab the 8 treasures and store them in the center boxes. You start with 3 Grabbers and get extra ones at 20,000 points. Watch out for the googlies! Super high resolution graphics.

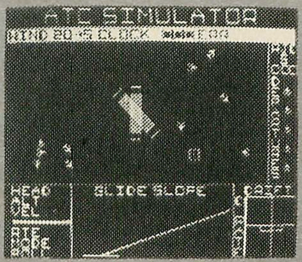
**32K MACHINE LANGUAGE**
**TAPE $27.95** **DISK $30.95**



## CU✻BER

Approaches the excitement and challenges of any Video Arcade. The hazards of CU✻BER are many. Help CU✻BER change the colors on the pyramid while avoiding many of the dangers always present. Vipers, the Nurd, the Dork, bonus points all add up to another exciting release from Tom Mix Software.

**32K MACHINE LANGUAGE**
**TAPE $27.95** **DISK $30.95**



## AIR TRAFFIC CONTROLLER

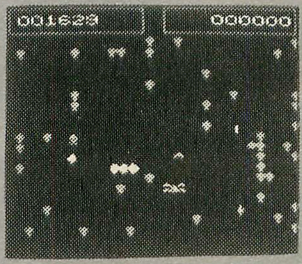
Air Traffic Controller is a computer model of an air traffic control situation for the TRS-80 Color Computer. Remotely Piloted Vehicles (RPV's) are operated by the controller in a situation similar to that of a commercial airline in that you must regulate landings and takeoffs of the vehicles.

**32K EXT. BASIC**
**TAPE $28.95** **DISK $31.95**

## KATERPILLAR II

The color computer has needed a perfect centipede type game since day one. You will throw all imitations aside when you see this. So close to the arcade you will start digging for quarters. Grapic to equal "The King" and "Buzzard Bait." Joysticks required.

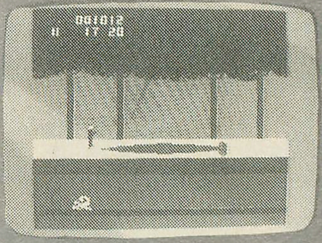
**16K MACHINE LANGUAGE**
**TAPE $24.95** **DISK $27.95**



## TRAPFALL

The "Pitfalls" in this game are many. Hidden treasures, jump over the pits, swing on the vine, watch out for alligators, beware of the scorpion. Another game for the Color Computer with the same high resolution graphics as "The King."

**16K MACHINE LANGUAGE**
**TAPE $27.95** **DISK $30.95**



## OTHER GREAT GAMES

**MAZE RACE** is a one or two player game. Play either against the built in timer or against your favorite opponent. **16K Machine Language** **$17.95**

**PROTECTORS** Exciting fast paced arcade game that looks and plays like the popular arcade game "Defender." Wave after wave of enemy fighters drop bombs on your city. **32K Ext. Basic**
**TAPE $24.95** **DISK $27.95**

**SOLO POOL** Now play pool with your color computer. Two players. Plays like machine language. Super Color, high resolution graphics. **16K Ext. Basic** **$17.95**

**CUTHBERT** Run your man on the outline of the squares. When you complete a square it fills in. Fill in all the squares before the bugs get you, and you win. Uses joysticks, one or two players. **16K Machine Language**
**TAPE $20.95** **DISK $23.95**

**BIRD ATTACK** A fast paced machine language arcade game. Shoot the birdmen before they descend upon you. Watch out for their bombs! **16K Machine Language** **$21.95**

## UTILITIES

**SCREEN PRINT ROUTINE** Prints contents of your graphic screen to an Epson, Microline or Radio Shack DMP Printers. Prints positive or reverse format. Horizontal or vertical, small and large printout. Print left, right or center of page. Specify printer when ordering. **TAPE $19.95** **DISK $21.95**

**PROGRAM PRINTER** This program will list basic programs to your printer in two column format. Saves paper and makes your listing look professional. Disk based. **$17.95**

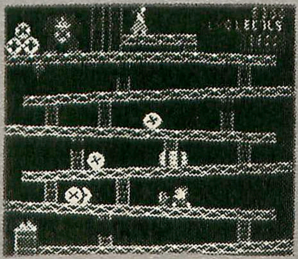
**TAPE TO DISK** New version works on both 1.0 and 1.1 DOS. Load the contents of most tape to disk automatically. **Machine Language**
**TAPE $17.95** **DISK $21.95**

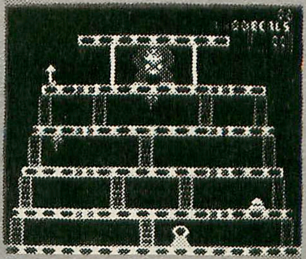
**MAIL LIST** Maintain a complete mailing list with phone numbers, etc. **Ext. Basic** **DISK ONLY $17.95**

**COLOR MONITOR** Written in position independent code. (May be located in any free memory). Very compact. Only occupies 1174 bytes of memory. Full featured, includes Break-Pointing of machine language programs, register display and modify, memory display and modify, and block memory move commands. Displays memory in hex and ascii format on one line 8 bytes long. **Machine Language**
**TAPE $24.95** **DISK $27.95**

**TOM MIX SOFTWARE**
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

**•ADD $1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•**
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE
ARCADE ACTION GAMES
TO ORDER CALL 616/957-0444

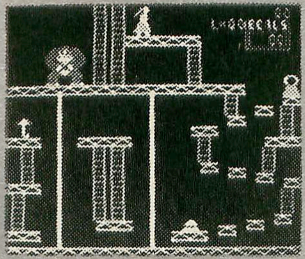


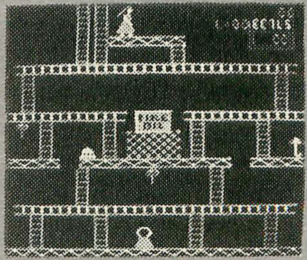


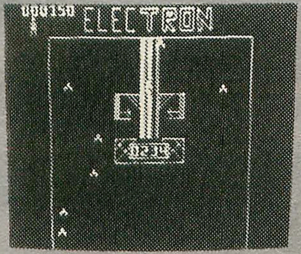
## THE KING

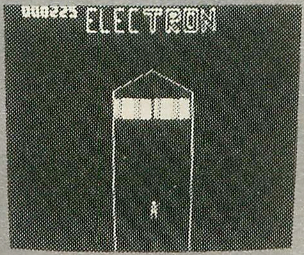
This game contains all 4 full graphic screens like the popular arcade game. Exciting sound and realistic graphics. Never before has the color computer seen a game like this. Early reviews say simply outstanding.

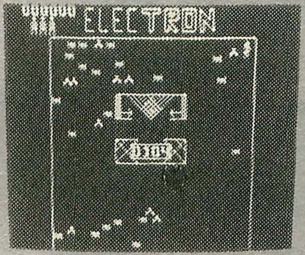
**JOYSTICKS REQUIRED**
**32K MACHINE LANGUAGE**
**TAPE $26.95**
**DISK $29.95**

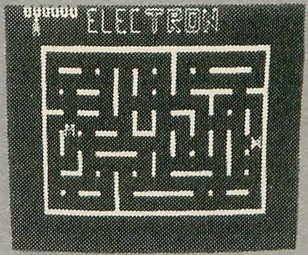








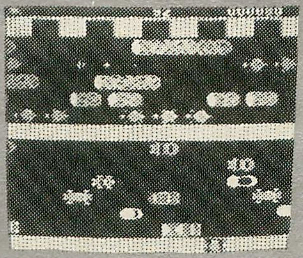




## ELECTRON

Electron is composed of four subgames. You must complete one level in order to advance to the next. Supplied with four men, you are subjected to more difficult games as you move ahead. Beam Buggy, Prachnids, Force Fields and a Maze!

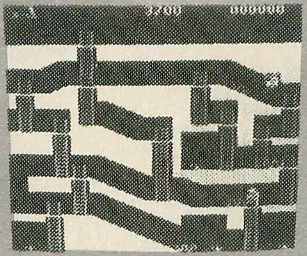
**JOYSTICKS REQUIRED**
**16K MACHINE LANGUAGE**
**TAPE $24.95 DISK $27.95**



## THE FROG

This one will give you hours of exciting play. Cross the busy highway to the safety of the median and rest awhile before you set out across the swollen river teaming with hidden hazards. Outstanding sound and graphics. Play from keyboard or joysticks.

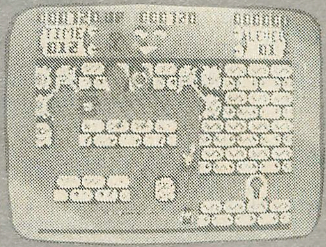
**16K MACHINE LANGUAGE**
**TAPE $27.95 DISK $30.95**



## KING TUT

Journey through the caverns of King Tut's tomb. You are on a quest to find treasures hidden in the cavrns below. You light your way with only a small candle that grows dimmer as time passes. Watch out for the snakes and the ghost of King Tut himself. **Five** screens challenge your abilities every step of the way. Joysticks required.

**16K MACHINE LANGUAGE**
**TAPE $27.95 DISK $30.95**



## THE TOUCHSTONE

You are one of many priests of Ra who has accepted the challenge of the touchstone. The challenge is a way for any of Ra's followers to become a favored high priest. Given limited use of Ra's powers, you will battle hidden dangers. Entering the mazes, you must be ready for anything.

**32K MACHINE LANGUAGE**
**TAPE $27.95 DISK $30.95**

## TOM MIX SOFTWARE

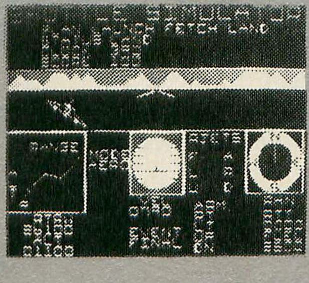
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

**•ADD $1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•**
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE

MasterCard ARCADE ACTION GAMES VISA

**TO ORDER CALL 616/957-0444**

## SPACE SHUTTLE



This program gives you the real feeling of flight. Full instrumentation complete to the max. Radar, altimeter, air speed, artificial horizon, fuel gauge, a mission status panel and much more. Actual simulation of space flight, weather conditions must be considered.

**JOYSTICKS REQUIRED**
**32K EXTENDED BASIC**
**TAPE $28.95 DISK $31.95**

see us at RAINBOWfest CHICAGO

# EDUCATIONAL

## VOCABULARY MANAGEMENT SYSTEM

**16K Extended basic/32K for printer output TAPE $39.95 DISK $42.95**

The Vocabulary Management System (VMS) is a series of programs designed to aid a parent or teacher in helping children to learn and practice using vocabulary and spelling words. The 9 programs that comprise the VMS include a full feature data entry/edit program, three printer output programs and 5 vocabulary/spelling game programs. The system's many outstanding features include:

—As many as 300 vocabulary words and definitions may be in the computer's memory at one time.

—Words and definitions may be saved on disk or tape.

—Remarks and/or comments can be saved with word files.

—A disk loading menu allows students to load disk files without typing file names.

—Word lists may be quickly alphabetized

—The three printer segments allow you to create and print individualized tests, puzzles, word-searches and worksheets.

—Answer keys may be printed for all worksheets and puzzles.

—The printer segments allow full use of your printer's special features.

—The 5 game programs are based on sound educational principles and provide practice in identifying words and matching them with their definitions in a fast-paced set of activities.

## STORY PROBLEMS

**STORY PROBLEMS** is a program that is designed to give practice in solving story problems (sometimes called statement thought or word problems) on the Color Computer. It is suitable for use in either a home or school environment. It is also a tool that will allow you to create new story problems to suit your children's needs and ability levels. It has many features that make it particularly attractive:

- Story problems involving addition, subtraction, multiplication, division or a combination of the four are presented to the student by slowly scrolling each letter of each problem onto the screen.
- Up to 5 students may use the program at the same time.
- There are 4, user modifiable, skill levels.

**16K EXT. BASIC TAPE $19.95 DISK $22.95**

## MATH DRILL

**MATH DRILL** is a program designed to help children to practice addition, subtraction, multiplication and division skills on the Color Computer. It has several features that make its use particularly attractive:

- Up to 6 students may use the program at the same time.
- Answers for addition, subtraction and multiplication are entered from right to left, just as they are written on paper.
- Commas may be included in the answers.
- Partial products for the multiplication problems may be computed on the screen.
- Division answers that have a remainder are entered as a whole number followed by the letter "R" and the remainder.
- The are ten, user modifiable, skill levels.
- A "SMILEY FACE" is used for motivation and reward. Its size increases relative to the skill level.
- Skill levels automatically adjust to the student's ability.
- A timer measures the time used to answer each problem and the total time used for a series of problems.
- After a problem has been answered incorrectly the correct answer appears under (above in division) the incorrect answer.

**REQUIRES 16K EXT. BASIC**
**TAPE $19.95 DISK $22.95**

## ESTIMATE

**ESTIMATE** is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the Color Computer. It has many features that make its use particularly attractive:

- Up to 5 students may use the program at the same time.
- There are 5, user modifiable, skill levels.
- The acceptable percent error may be changed as a student's skill improves.
- A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
- If a problem has been answered incorrectly, the student is told the percent error and asked to try again.
- If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.
- A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.
- The (BREAK) key has been disabled so that a child will not inadvertently stop the program from running.

**REQURIES 16K EXT. BASIC**
**TAPE $19.95 DISK $22.95**

## TEACHER'S DATABASE

**TEACHER'S DATABASE** is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive:

- Information on as many as 100 students (or more) may be in the computer at one time.
- Each student may have as many as 20 (or more) individual items of data in his/her record.
- The program will run from cassette or disk.
- Cassette and disk files are completely compatible.
- The program is menu driven.
- Records may be easily changed, deleted, combined or added.
- Information about students may be numerical or text.
- Records may be quickly alphabetized.
- Records may be sorted by various criteria.
- Records may be reordered (ranked) based on test scores or other data.
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- A full statistical analysis of data may be done and sent to the printer.
- Student test scores may be weighted.

**REQURES 32K EXT. BASIC**
**TAPE $39.95 DISK $42.95**

## PRE-ALGEBRA I INTEGERS

**INTEGERS** is a series of four programs designed to give students practice in working with addition, subtraction, multiplication, division and the comparison of integers. It has many features that make a very valuable tool for introducing and/or maintaining skills:

- Up to 4 students may use the program at the same time.
- There are 9, user modifiable, skill levels.
- Students are given two opportunities to answer a problem.
- A detailed report of student performance, including number correct on first try, number wrong, total time used and percentage score, is presented at the end of a series of problems.
- The programs will run on a 16K TRS-80 Color Computer with or without disk drive.

Four distinct problem formats are presented. The first presents problems in this format: $-12 + -9 = ?$. The second program presents a problem with missing numerals in this format: $-7 - ? = 18$. The third program presents a problem with a missing sign: $8 - ?6 = 14$. The last program asks the student to determine the relationship ( =,  or  ) between two statments $3 - 9$ (??) $-4 - 5$.

**TAPE $29.95 DISK $32.95**

### SPECIAL EDUCATIONAL PACKAGE

**SPELLING TEST — WORD DRILL**
**MATH DRILL — ESTIMATE**
**STORY PROBLEMS**
**ALL FOR**
**TAPE $79.95 DISK $82.95**

**TOM MIX SOFTWARE**
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

**•ADD $1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•**
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE
ARCADE ACTION GAMES
MasterCard VISA
TO ORDER CALL 616/957-0444

**EDUCATION NOTES**

**4K**

# Guess The Missing Number

**By Steve Blyn**
**RAINBOW Contributing Editor**

Can you guess the next number in the sequence below?

5, 9, 13, 17, __

Okay. That was pretty easy. Can you state the rule that governs this set of numbers? The rule we had in mind here is adding four to the previous number. Here is a harder one.

5, 14, 41, 122, __

The rule this time is tripling the previous number and subtracting one from the resulting product. The answer is 365.

This type of exercise is quite familiar to many math classes. It is useful because it forces the students to think as well as compute. Discovering the rule that the example uses is the key here rather than the actual arithmetic computations.

Too often our children are taught to do the arithmetic without a thought as to why it is being done. They sometimes miss out on conceptualizing the math for the sake of a correct answer. The error in this type of learning becomes apparent as the student gets older and is exposed to more difficult math. If the earlier concepts were not learned and internalized, then the harder math sometimes becomes close to impossible.

The exercise of guessing the missing number helps students to think about what they are doing. In our second example, the student should observe that the numbers are rising too fast for the concept to be addition. This should lead him to suspect either multiplication or powers. Since 14 is nowhere near a power of five, multiplication should become the obvious choice.

By doubling and tripling, the concept used becomes clearer. This type of math is far more productive than simply telling the student to triple certain numbers and then subtract one. The kind of reasoning encouraged here also helps later on in developing good skills in algebra.

Our program illustrates two of many possible concepts. The first is adding a constant number and the second is doubling. The program chooses between the two concepts randomly. The numbers are also chosen randomly.

Lines 140-200 set up the routine for printing the doubling routine and awaiting an answer. If doubling is too easy, try a more difficult concept by changing the numbers on lines 160, 170, and 180 and then adjusting the answer on lines 220 and 230.

Lines 260-330 set up the routine for printing the routine that adds a constant value to the previous number. Line 260 sets the value of the constant to a number between one and 10. Change this random H value to suit your needs.

A third, fourth, or fifth math concept could also easily be added to this program to expand its potential uses. If you desire to do this, then increase the random value of RR on line 100 and include other subroutines to go to between lines 120 and 130.

Please look at our program as a shell for you to modify as needed. We encourage you to change the concepts or alter the random numbers to suit your students' needs. An interesting possibility would be to have students create their own "concepts to guess." They could then adjust the program's routines to test each other with original examples.

*(Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He and his wife, Cheryl, own Computer Island.)*

210 . . . . . 248
END . . . . . 149

**The listing:**

```
10 REM"NUMBER SEQUENCES"
20 REM"STEVE BLYN,COMPUTER ISLAN
```

```
D,NY,1984"
30 CLS0
40 PRINT@7,"NUMBER  SEQUENCES";
50 FORT=1056TO1087:POKET,255:NEX
T
60 PRINT@66,"TRY TO FIND THE NEX
T NUMBER.";
70 FORT=1120 TO 1151:POKET,255:N
EXT
80 REM"X IS THE ORIGINAL NUMBER"
90 X=RND(18)+2
100 RR=RND(2)
110 IF RR=1 THEN 140
120 IF RR=2 THEN 260
130 REM"THE DOUBLING ROUTINE"
140 PRINT@160," "
150 PRINT@160,X;",";:SOUND200,3
160 PRINT@165,X*2;",";:SOUND210,
3
170 PRINT@170,X*4;",";:SOUND220,
3
180 PRINT@175,X*8;",";:SOUND240,
8
190 PRINT@184,"---";
200 PRINT@182,"";:INPUT N
210 FORT=1248TO1279:POKET,255:NE
XTT
220 IF N=X*16 THEN PRINT@299,"CO
RRECT!";:GOTO370
230 IF N<>X*16 THEN PRINT@288,"S
ORRY,THE RULE WAS DOUBLING THE P
REVIOUS NUMBER."
240 PRINT@384,"THE CORRECT ANSWE
R IS";X*16:GOTO 380
250 REM"THE ADDING A CONSTANT #
ROUTINE...'H' IS THAT NUMBER"
260 H=RND(10)
270 PRINT@160," "
280 PRINT@160,X;",";:SOUND200,3
290 PRINT@165,X+H;",";:SOUND210,
3
300 PRINT@171,X+H+H;",";:SOUND22
0,3
310 PRINT@177,X+H+H+H;",";:SOUND
240,8
320 PRINT@187,"---";
330 PRINT@185,"";:INPUT N
340 IF N=X+H+H+H+H THEN PRINT@29
9,"CORRECT!";:GOTO 370
350 IF N<>X+H+H+H+H THEN PRINT@2
88,"SORRY,THE RULE WAS ADDING";H
:PRINT"TO THE PREVIOUS NUMBER."
360 PRINT@384,"THE CORRECT ANSWE
R IS";X+H+H+H+H:GOTO380
370 FORT=200TO250STEP3:SOUNDT,2:
NEXTT:RUN
380 PRINT@484,"PRESS ANY KEY TO
GO ON";
390 A$=INKEY$
400 IF A$="" THEN 390 ELSE RUN
```

MUL-T-SCREEN

RAINBOW CERTIFICATION SEAL

COLOR CHARACTER GENERATOR

HAS ALL STANDARD FEATURES

- Total of 10 character sizes, from 8*4 to 42*24.
- Mix text & graphics in any PMODE.
- Mix up to 5 character sizes in 4 colors on one screen.
- Recognizes all commands & keys.
- Full underline in all PMODES.
- Recognizes CLS, PRINTTAB, PRINT@, as well as its own cursor controls.
- Includes 2 sample BASIC programs.

HAS MANY MORE FEATURES THAN HIGHER PRICED PROGRAMS

- Prints vertically.
- Pos. & neg. screen dumps in 2 sizes.
- 4 defineable limited text screens can limit the text anywhere from a single character to the entire screen.
- Regular and graphic scroll types.
- Horizontally scrolling one line screens. Up to 4 can be used at the same time.
- Special trace delay for debugging.
- Printer control outputs characters to screen & printer simultaneously.

INCENTIVE SOFTWARE
P.O. BOX 7281
Port Huron MI 48301 U.S.A.
or
P.O. BOX 323 Station-B
London Ont. Canada N6A 4W1
(519) 681-0133

MasterCard VISA

MIN. 16K (EXT. BASIC NOT REQUIRED)
TAPE - 24.95 US or 29.95 CDN
DISK - 27.95 US or 32.95 CDN
7% SALES TAX - ONTARIO ONLY
OUTSIDE U.S. & CANADA ADD $2

GREETINGS from
UNCLE BERT

**Greetings!**

The Woofensburgers went to the county fair again this year — Bertha, Ben and I. Ben loved the animal exhibits, and showed a strange interest in that stringy nonsense made from recycled insulation and food coloring that people call cotton candy. Bertha, as I suppose you know, loves to race cars, and so she insisted on spending two hours with me in the bumper cars. Now, I don't know whether all of you have had a lot of experience with bumper cars, but just in case you haven't, I'll try to explain.

First, you have a large, round, rink-like affair, under a tent. Something like this:

```
TO WALL :R

   PU
   REPEAT 120 (FD :R
   DOT
   BK :R RT 3)
   END

TO DOT

   PD
   RT 90 FD 1
   BK 1 LT 90
   PU
   END

TO RINK

   WALL 15
   WALL 95
   END
```

Then, you pay your money, and climb into a fat little car that goes around and around in a circle. Something like this (with X Y values of, for example, 40 80):

```
TO CAR :X :Y

   PU
   SX :X SY :Y
   REPEAT 800 (FD 25 RT 18)
   END
```

Of course, there are other drivers and other cars in the rink.

```
TO BUMPERCAR

   RINK
   HATCH 1 CAR 40 80
   HATCH 2 CAR 50 80
   HATCH 3 CAR 40 85
   HATCH 4 CAR 45 70
   CAR 50 75
   END
```

In addition, these fat little cars are not easy to steer, and so they have a tendency to bump into the walls of the rink.

```
TO CENTEROFRINK

   HOME
   REPEAT 360
   (RT 1)
   CENTEROFRINK
   END

TO BUMP1

   IF NEAR 0>75
   (BK 25 RT 90 FD 20)
   END

TO BUMP2

   IF NEAR 0<2
   (BK 25 LT 90 FD 10)
   END

TO BUMPWALL

   IF ME=1 (BUMP1)
   IF ME=2 (BUMP2)
   IF ME=3 (BUMP1)
   IF ME=4 (BUMP2)
   IF ME=5 (BUMP1)
   END

TO CAR2 :X :Y

   PU
   SX :X SY :Y
   REPEAT 800 (FD 25 RT 18
   BUMPWALL)
   END

TO BUMPERCAR2

   RINK
   HATCH 1 CAR2 40 80
   HATCH 2 CAR2 50 80
   HATCH 3 CAR2 60 85
   HATCH 4 CAR2 65 100
   HATCH 5 CAR2 70 85
   CENTEROFRINK
   END
```

Also, sometimes the fat little cars have a tendency to bump into each other.

```
TO STOPNGO

   REPEAT 8 (RT 36)
   END

TO BUMPCAR

   IF ME=1 (IF NEAR 2<20
   (STOPNGO))
   IF ME=2 (IF NEAR 3<20
(STOPNGO))
IF ME=3 (IF NEAR 4<20
(STOPNGO))
IF ME=4 (IF NEAR 5<<20
(STOPNGO))
IF ME=5 (IF NEAR 1<20
(STOPNGO))
END
```

And a really proper car ought to have built into its subprocedure a BUMPCAR, so that CAR2 looks like this:

```
TO CAR2 :X :Y

  PU
  SX :X SY :Y
  REPEAT 800
  (FD 25 RT 18
  BUMPWALL BUMPCAR)
  END
```

So, that's basically what the bumper cars are like. You may have noticed that in getting my Color Computer to do bumper cars, I did two new things: I used a conditional IF inside of a second conditional IF, and I snuck in a new function, the ME function. The IF inside of the IF might be self-explanatory. The new ME function calls up the number of the current turtle, that is, the turtle currently moving. The combined "IF ME=a number" sequence commands the computer to examine constantly the number of the current turtle, all the while saying to itself: "IF the number of the current turtle is a certain number, then do whatever follows in parentheses." Make sense?

You may also have noticed how important it is to keep the mother turtle at the center of the rink (with CENTEROFRINK), since the BUMPWALL procedure works well only because the mother turtle is continually "defining" the edges of the rink.* You might wish to hide the turtle in CENTEROFRINK, but remember to place the HT after HOME, since HOME otherwise erases HT.

One thing that troubles me about this whole BUMPERCAR operation is that the hatched turtles on the screen don't really give you a good idea about how the real cars look. Fortunately, there is another command in CoCo LOGO that allows us to change the shape and appearance of the screen turtle. The command is called SHAPE, and it works in the following way. Basically, for whatever procedure you're working with, you create a subprocedure to redefine the shape of the turtle. For instance, if I wanted to make the turtle or turtles look like cars, I might do the following:

```
TO CARSHAPE

  SHAPE ULLFFFRRD-
  FFFFRFLFFFFLFRFFFFRRU-
  FFFFFDFRR-
  FFFFRFRFFFUBBBLLD-
```

---

*(*Actually, Uncle Bert could have done this differently. If NEAR is made to refer to the number of a turtle that does not exist, NEAR automatically gives the distance between the current turtle and "home" [the center of the screen]. Thus, Bert didn't really need to use the subprocedure CENTEROFRINK.)*

TRS-80 COMPUTER DISCOUNTS

COLOR COMPUTERS

| | |
|---|---|
| 26-3026 16k color II | 139.95 |
| 26-3027 16k ext color II | 165.00 |
| 26-3127 64k color comp | 210.00 |
| 26-3022 1st disk drive | 329.95 |
| 26-3023 2nd disk drive | 229.95 |

PRINTERS

| | |
|---|---|
| 26-1271 DMP-110 | 299.95 |
| 26-1254 DMP-200 | 510.00 |
| 26-1255 DMP-120 | 395.00 |
| 26-1257DWP-210 | 620.00 |

MODEL 4 and 100's

| | |
|---|---|
| 26-1067 mod 4 16k | 829.95 |
| 26-1069 mod 4 64k 2 dr. | 1695.00 |
| 26-3801 mod 100 8 k | 699.95 |
| 26-3802 mod 100 24k | 839.95 |

We Carry the Complete Line of TRS-80 Computer Products at Discount Prices

CALL FOR A FREE PRICE LIST 800-257-5556
IN N.J. CALL 609-769-0551

WOODSTOWN ELECTRONICS
Rt. 40 E. WOODSTOWN, N.J. 08098

```
    FFFFRRFFFUBBBLLD-
    LFRFFFF
    END
```

Then, I could place the CARSHAPE inside of CAR2, and run the BUMPERCAR2 procedure once more.

```
TO CAR2 :X :Y
    PU
    SX :X SY :Y
    CARSHAPE
    REPEAT 800
    (FD 25 RT 18
    BUMPWALL BUMPCAR)
    END
```

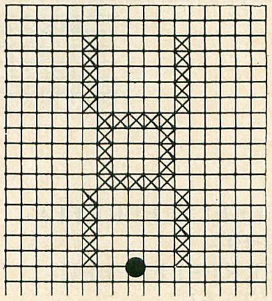
Should I explain what all those F's and D's and R's and so on are doing after the SHAPE command? The SHAPE command allows you to draw a new turtle shape, but you have to specify all the dots that will make up your new shape. In specifying the new dots, you must do something that resembles drawing with the turtle, but is not the same. You have the following powers at your disposal:

- You can make your shape-pen move forward one dot with the letter F, and you can make your shape-pen move backward one dot with the letter B.
- You can make your shape-pen turn to the right 45 degrees with the letter R, or to the left 45 degrees with the letter L.
- You can pick up your shape-pen with the letter U and place it down with the letter D.

I know all of that sounds simple. But believe me, if you're not careful, drawing new shapes can be less fun than fishing with a paper clip. Let me explain some of the difficulties:

- It is easy to make mistakes. It's easy to lose track of all those letters, and you have to remember always to put the hyphen at the end of each of your lines in the statement.
- You have to remember that a single R or L turns your pen 45 degrees — but does not move it.
- Raising the shape-pen up does not affect the dot that the pen is resting on at the moment — it only affects dots the pen moves to. But (was this done deliberately to confuse me or what?) putting the pen down does color whatever dot the shape-pen happens to be resting on.
- If you ink a dot and then go over it once again with the pen dot, the ink is erased.

I designed the CARSHAPE first by drawing it out on graph paper. The drawing below shows the shape as I planned it (with the X's representing dots of the shape-pen, and the O representing the shape-pen's beginning position).



COSMOS© COMPUTER SERVICES, INC.

112 W. WISCONSIN AV.
KAUKAUNA, WI 54130
(414) 766-1851

STOCK ITEMS SHIPPED SAME DAY!

THE COMPLETE TRS-80® LINE

- ELITE CALC $54.95
- ELITE WORD $54.95
- ELITE FILE $67.00
- TOM MIX SOFTWARE CALL FOR PRICE

THE COSMOS CONNECTION IS A COMPLETE SERIAL TO PARALLEL INTERFACE FOR THE COLOR COMPUTER TO THE GEMINI — 10X and 15X PRINTERS.

$289.00

THE COSMOS CONNECTION

- NO AC REQUIRED
- SWITCHABLE BAUD RATE AT: 600 1200 2400
- HIGH QUALITY CONSTRUCTION
- COMPACT
- 90 DAY WARRANTY

$60.00

10X - $289.00
15X - $445.00
Delta 10 - $484.00
Delta 15 - $597.00

THE GEMINI-10X PACKAGE READY TO PLUG IN TO YOUR COLOR COMPUTER ONLY *

$339.00
GEMINI - 10X PACKAGE **

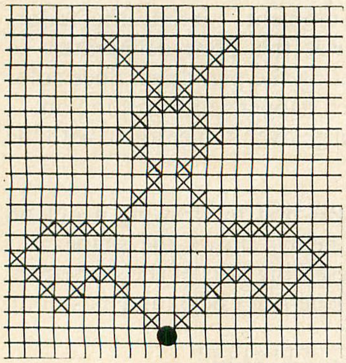
star micronics • inc
THE POWER BEHIND THE PRINTED WORD.

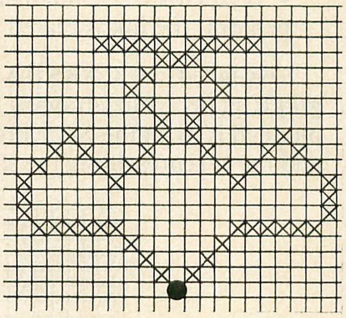
MasterCard VISA

*Plus - U.S. ORDERS Add $10.00 Shipping & Handling
*Plus - CANADIAN ORDERS Add $25.00 for Shipping & Handling
**FREE - Shipping & Handling in U.S. with Package Orders
**Plus - CANADIAN ORDERS Add $15.00 for Shipping & Handling with Package Orders

TRS-80 IS A TRADEMARK OF TANDY CORP. PRICES AND SPECIFICATIONS SUBJECT TO CHANGE.

I thought to myself that the CARSHAPE looked a little bit like a spider, and so I thought I'd move on to try a couple of insect shapes. One shape I liked was a bee. And I made my bee fly by constructing two slightly different versions, and then having the computer shift from one to the other. In my drawing, I tried to minimize the number of times I would have to cross over my own trail (to avoid the added complications of too many U's and D's).





```
TO BEE1

    SHAPE LFFFFLFLFFRRFFF-
    RRFFRFFFFL-
    FFFLFLFFRRFFLFLFFFU-
    BBBBDRRFFFFU-
    BBBBRFD-
    RFFRRFFLFLFFF-
    LFFFFRFFRRFFFRRFFLFLFFF
    END

TO BEE2

    SHAPE LFFFFLFFFFFRFRFFRFFF-
    RRFFFLLFFFLFLFFRRFFLFLLFFFFU-
    BBBBBBBBBBD-
    FFFFLLFRRFU-
    BBLLLFD-
    FRRFFLFLFFFLLFFFRRFFFR-
    FFRFRFFFFFLFFF
    END
```

Next, I coordinated the two different bee shapes (using a time delay in which I had the computer repeat nothing 100 times) into one animated bee.

```
TO ONEBEE

    PU RT 90
    REPEAT 200 (BEE1 DELAY FD 5
    BEE2 DELAY FD 5)
    END

TO DELAY

    REPEAT 100 ()
    END
```

Having tested my animated bee, I was ready to put the little bugger to work. First, I defined one moving segment of the bee as a unit of length.

```
TO BEE

    BEE1 DELAY FD 3
    BEE2 DELAY FD 3
    END
```

Then I inserted the unit of length into a drawing procedure.

```
TO HEXAGON

    REPEAT 6
    (REPEAT 2 (BEE) RT 60)
    END
```

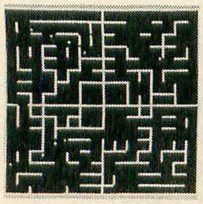
And, of course, I couldn't resist going back to the old hatched HONEYCOMB procedure that I told you about in my last letter.

```
TO MORE

    REPEAT 6 (HEXAGON FD 10 LT 60)
    END

TO MOREMORE

    REPEAT 5 (MORE
    REPEAT 2 (FD 10 RT 60)
    FD 10 LT 180)
    END

TO HONEYCOMB

    HATCH 1 MOREMORE FD 10 LT 60
    HATCH 2 MOREMORE FD 10 LT 60
    HATCH 3 MOREMORE FD 10 LT 60
    HATCH 4 MOREMORE FD 10 LT 60
```

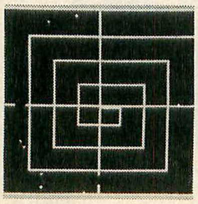
AT WITS END

*(C) 1984 by Derringer Software, Inc.*

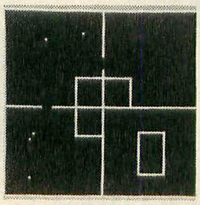
You may lose your sanity while playing this new game from Derringer Software! As the resident caretaker at the local "Home for burned-out programmers", your job is to keep the public safe by keeping the patients within the confines of the central compound. But, every now and then the somewhat erratic patients start running about and you find yourself having to open and close doors to get them to safety. Of course as one gets in, another may jump out! Three separate display screens with nine levels of play for each. Play against the clock for the best time. Score kept for each game and level.



CRAZY MAZE



SPIRALMANIA



BEGINNER'S BOX

The CRAZY MAZE is completely different each time you play, SPIRALMANIA will be a true test of mental strength. The BEGINNER'S BOX is for those short on patience!

$24.95

see us at RAINBOWfest CHICAGO

Requires joysticks and can be played on 16K Extended tape or disk systems! Please indicate tape or disk when you order. Send check or money order to: Derringer Software, Inc. P. O. Box 5300, Florence, S.C. 29502-2300. Visa or Master Card customers can call (803) 665-5676 9:00am to 5:00pm Mon-Fri. Please include $2.00 for shipping and handling — No COD's.

★ See the ad for Double Buster also ★

```
   HATCH 5 MOREMORE FD 10 LT 60
   PC 2
   MOREMORE
   END
```

I found, however, that this did not work so well. For one thing, the complexity of the hatching made my animation too slow. I fixed that by eliminating the delay. For another thing, the drawing of the honeycomb was not as accurate. I began to suspect that my new unit of length was not as reliable as the normal length units. That problem I couldn't quite fix. Can you? The closest I came to fixing it was to place a PU in the BEE procedure, producing swarming bees without their honeycomb. After that, I animated a pig and placed her and a couple of hatched pigs into the BUMPERCAR2 procedure, producing a pig race.

One thing I almost forgot to mention about the county fair is the coin toss. That was my favorite event, and I must admit I got to be quite skilled at it. In the coin toss, first you have a coin.

```
TO COIN1

   SHAPE LLFRFFFRFFFRFFF-
   RFFFRFFFRFFFRFFFRF
   END

TO COIN2

   SHAPE UFFFFDLLFFFFRRF-
   RRFFFFFFFFFRR-
   FRRFFFF
   END

TO COIN :D

   PU
   REPEAT :D
   (COIN1 DELAY FD 1
   COIN2 DELAY FD 1)
   END

TO DELAY

   REPEAT 20 ()
   END
```

And the object of the game is to toss the coin in a cup that has been randomly placed on a flat surface.

```
TO CUP

   HT
   RT 180
   REPEAT 11 (FD 3 RT 18)
   END

TO PLACECUP

   CLEAR
   MAKE :X RANDOM 190+30
   SX :X SY 20
   CUP
   END

TO PLACECOIN

   PU
   SX 240 SY 100
   END

TO SETGAME

   PLACECUP
   PLACECOIN
   END

TO T :H :D

   SH :H
   COIN :D
   END
```

A good time was had by all. Ben had enough cotton candy to get sick. Bertha and I exercised our driving skills. And I wasted money on the coin toss. By the way, I brought home a few stuffed animals, mostly pigs. I remain,

— **Uncle Bert**

P.S. You can send your cards and letters to me in care of my good friend Dale Peterson. Just address them like this:

Uncle Bert Woofensburger
c/o Dale Peterson
THE RAINBOW
9529 U.S. Highway 42
P.O. Box 209
Prospect, KY 40059

© copyright 1984
By W. Bert Woofensburger
and
Dale Peterson

STOCK & FUND INVESTING
with the
TRS-80* COLOR COMPUTER
USE FUNDGRAF AND FUNDFILE

FUNDGRAF is a stock market analysis program that not only graphs and analyzes funds or stocks, but also makes decisions on when to BUY and SELL. Improve market timing using your COCO.

GRAPHS fund's progress (up to 200 weeks). SUPERIMPOSES for comparison: a line of constant percent growth or a graph of any other fund (or stock). CALCULATES over any time span: the percent price change and the moving average (any span). INDICATES BUY and SELL signals. FUNDGRAF requires 16 K ECB min.
16/32 K Tape ................ $49.95
16/32 K 5 in. Disk ........... $69.95
ADD $2 handling on all orders.

FUNDGRAF—A STOCK MARKET ANALYSIS PROGRAM FOR 16K EX TRS-80 COLOR COMPUTER
TRS-80 COLOR COMPUTER - TM TANDY CORP.

FUNDFILE is a portfolio and account management program for securities. Manage single or multiple portfolios of stocks, mutual funds, bonds, money market funds, etc. FUNDFILE allows easy maintenance of all your records for accurate portfolio evaluation. NEW 32 K VERSION of FUNDFILE summarizes all transactions (dividends, interest, purchases and sales) between any two dates of your choice - weekly, yearly, etc. Categorizes interest and dividends paid as to tax liability (tax free, etc.) and capital gains as long or short term. Great for tax reports.

FUNDFILE REQUIRES 16 K ECB min. and 80-COL PRINTER.
5-in. Diskette only for 16 K ECB ................ $27.95
5-in. Diskette only for 32 K ECB ................ $37.95
ADD $2 handling on all orders.

Write for free brochure for details. Dealer inquiries invited.

PARSONS SOFTWARE, DEPT. G
118 WOODSHIRE DRIVE
PARKERSBURG, WV 26101

# Equip Your Computer With A Phoneme Speech Synthesizer

**By Tony DiStefano**
**RAINBOW Contributing Editor**

This month I have an interesting project. It is using the Votrax SC-01 and the cartridge connector. This is an LSI (large scale integration) chip. With the right interface, this chip will translate certain predetermined data into voice sounds. In other words, it talks. It is a phoneme speech synthesizer. I will show you how to connect it to the Color Computer and how to use it.

The first thing we must do is get all the parts. A parts list appears at the end of this article. You will need, what I call, the standard "kit building tools." This includes soldering iron, solder, pliers, cutters, screwdrivers, knife, drill and bits, hacksaw and your favorite beverage.

There is nothing hard about this project. The regular care in project building will suffice. The Votrax chip is a CMOS chip, so be careful not to zap it with a static charge. Using the schematic in Figure 1, mount and solder all the components in the parts list. Use the sockets for the two IC's. The triangle boxes in the schematic refer to the Color Computer connector. Remember that pin #1 on the Color Computer is the top right-hand side looking into the cartridge slot. This chip needs 12V to operate so that means it will not work with the CoCo 2, unless you have built my 12V supply for the CoCo 2. It also uses the SCS select line, so if you have a disk drive you must use one of the many expansion boxes available. If you have the Radio Shack Multi-Pak Interface, put the voice box in slot 3, the controller in slot 4, and type in this extra line in the BASIC program.

```
1 POKE 65407,254
```

---

*(Tony DiStefano is well known as an early specialist in Color Computer hardware projects. He is one of the acknowledged experts on the "insides" of CoCo.)*

Once you are finished mounting the components, type in the short program (listed later), and try it out. Turn the volume of your TV up, because the sound is routed to the sound output of the Color Computer, and it will come out of your TV. Now that your voice box works, here are some details you will need to work on the Votrax chip. This chip phonetically synthesizes continuous speech of unlimited vocabulary. A phoneme is a building block for speech. It is like a single lip movement, like "ohhh" or "ahhh." It is a part of speech. For example, the word hello is made of several phonemes. The first is 'H', next would be 'E', followed by an 'L' and a long 'O'. Together, these phonemes pronounce the word "hello." In order to make a complete sentence, you must break each word down phoneme by phoneme. The SC-01 is capable of reproducing 64 phonemes. Each phoneme is a part of everyday speech. Using all of the 64 phonemes, you can produce almost any speech pattern you wish. Table 1 describes each phoneme, the numeric value, the duration in milliseconds, and an example of the sound it makes.

One more feature the SC-01 has is that it has built in inflection. This is the ability to speed up or slow down the speech in order to add accent to the voice. An example would be when you ask a question. There are four inflections (or speeds). They are invoked by adding one of four values to the phoneme code. The four values are 0, 64, 128, 196. The default is 0, or the slowest speed. The next three speeds are each a little faster than the last.

Okay, once your voice project works, you may want to put it in a small case. An old game pak from Radio Shack will do fine. Trim the PCB so that it will fit in the case. If the posts are in the way, cut them off and glue the pak shut. If you don't have an old pak you can get one from Bob Rosen

### Table 1

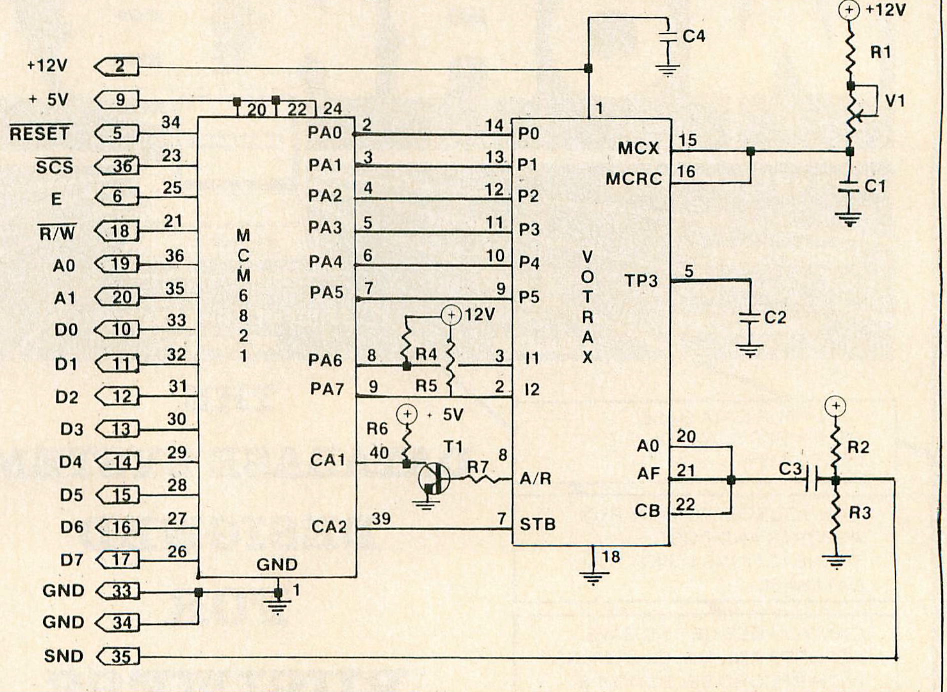
| Phoneme Code | Phoneme Symbol | Duration (ms) | Example Word |
|---|---|---|---|
| 00 | EH3 | 59 | jacket |
| 01 | EH2 | 71 | enlist |
| 02 | EH1 | 121 | heavy |
| 03 | PA0 | 47 | no sound |
| 04 | DT | 47 | butter |
| 05 | A2 | 71 | made |
| 06 | A1 | 103 | made |
| 07 | ZH | 90 | azure |
| 08 | AH2 | 71 | honest |
| 09 | I3 | 55 | inhibit |
| 10 | I2 | 80 | inhibit |
| 11 | I1 | 121 | inhibit |
| 12 | M | 103 | mat |
| 13 | N | 80 | sun |
| 14 | B | 71 | bag |
| 15 | V | 71 | van |
| 16 | CH* | 71 | chip |
| 17 | SH | 121 | shop |
| 18 | Z | 71 | zoo |
| 19 | AW1 | 146 | lawful |
| 20 | NG | 121 | thing |
| 21 | AH1 | 146 | father |
| 22 | OO1 | 103 | looking |
| 23 | OO | 185 | book |
| 24 | L | 103 | land |
| 25 | K | 80 | trick |
| 26 | J* | 47 | judge |
| 27 | H | 71 | hello |
| 28 | G | 71 | get |
| 29 | F | 103 | fast |
| 30 | D | 55 | paid |
| 31 | S | 90 | pass |
| 32 | A | 185 | day |
| 33 | AY | 65 | day |
| 34 | Y1 | 80 | yard |
| 35 | UH3 | 47 | mission |
| 36 | AH | 250 | mop |
| 37 | P | 103 | past |
| 38 | O | 185 | cold |
| 39 | I | 185 | pin |
| 40 | U | 185 | move |
| 41 | Y | 103 | any |
| 42 | T | 71 | tap |
| 43 | R | 90 | red |
| 44 | E | 185 | meet |
| 45 | W | 80 | win |
| 46 | AE | 185 | dad |
| 47 | AE1 | 103 | after |
| 48 | AW2 | 90 | salty |
| 49 | UH2 | 71 | about |
| 50 | UH1 | 103 | uncle |
| 51 | UH | 185 | cup |
| 52 | O2 | 80 | for |
| 53 | O1 | 121 | aboard |
| 54 | IU | 59 | you |
| 55 | U1 | 90 | you |
| 56 | THV | 80 | the |
| 57 | TH | 71 | thin |
| 58 | ER | 146 | bird |
| 59 | EH | 185 | get |
| 60 | E1 | 121 | be |
| 61 | AW | 250 | call |
| 62 | PA1 | 185 | no sound |
| 63 | STOP | 47 | no sound |

*** T must precede /CH/ to produce CH sound.**
**D must precede /J/ to produce J sound.**

### Parts List

| ID | Description |
|---|---|
| IC1 | MC621 |
| IC2 | VOTRAX SC-01 |
| R1 | 2K OHMS |
| R2,R3,R6 | 4.7K OHMS |
| R4,R5 | 10K OHMS |
| R7 | 100K OHMS |
| C1 | 220 pf |
| C2 | .01 Mf |
| C3,C4 | .1 Mf |
| T1 | 2N2222 |
| S1 | 40-pin socket |
| S2 | 22-pin socket |
| PCB | 40-pin edge card |

**Figure 1:**


+12V
+ 5V
RESET
SCS
E
R/W
A0
A1
D0
D1
D2
D3
D4
D5
D6
D7
GND
GND
SND
MCM6821
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
CA1
CA2
GND
VOTRAX
P0
P1
P2
P3
P4
P5
I1
I2
A/R
STB
MCX
MCRC
TP3
A0
AF
CB
C1
C2
C3
C4
R1
R2
R3
R4
R5
R6
R7
V1
T1
+12V
+ 5V

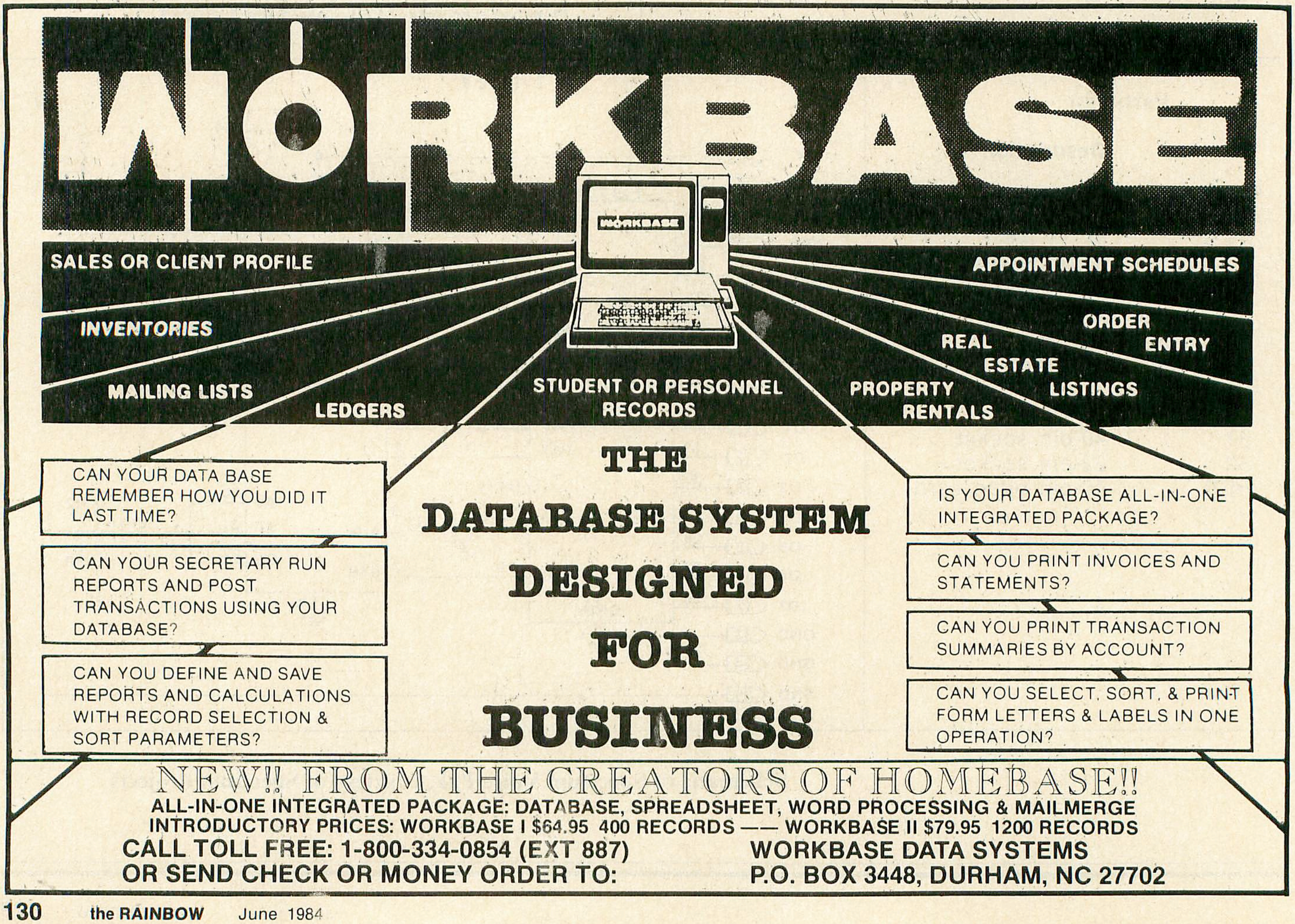
Schematic of Spectrum Voice Pak, courtesy of Spectrum Projects at Spectrum Projects for $6. The Votrax SC-01 chip is also available from the same company for $35. If you don't want to put it together yourself, you can get a complete Votrax package for $69.95 from him too. To order the Votrax chip or the case from Spectrum Projects, dial (212) 441-2807. In Canada call MICRO R.G.S. at (800) 361-5155.

Til next time, *au revoir.*

110 ...... 249
END .... 254

**The listing:**

```
10 CLS : A = 65344 ' VOTRAX LOCA
TION
20 POKEA+1,0:POKEA,255:POKEA+1,5
2 ' INIT PIA
30 POKE65281,180:POKE65283,61:PO
KE65315,60 ' INIT COCO SOUND OUT
PUT
40 X=63:GOSUB200
50 PRINT@200,"VOTRAX SC-01"
60 DATA 27,47,24,52,53,55,62,62,
21,0,9,47,0,12,12,56,60,60
70 DATA 25,25,21,24,58
80 DATA 25,25,50,49,12,37,34,54,
55,42,58
90 DATA 62,62,62,62
100 DATA 6,33,41,14,60,41,31,60,
41,30,60,41,60,41,2,1,29,30,26,6
0,41
110 DATA 6,33,41,42,16,21,0,9,41
,30,26,0,6,33,41,25,0,6,33,41
120 DATA 2,0,35,24,2,1,12,2,1,13
,52,53,55,3
130 DATA 37,60,41,62,25,34,54,55
,55,21,49,58,2,1,31,42,60
140 DATA 33,41,34,54,55,55,15,60
,33,41,30,50,14,35,24,34
150 DATA 54,54,2,1,25,31,31,45,2
1,0,9,41,18,60,41
160 DATA 63
170 FOR I=1 TO 142:READX:GOSUB20
0:NEXT I
180 X=63:GOSUB200
190 END
200 POKEA,X ' STORE DATA
210 POKEA+1,52 ' STROBE ON
220 POKEA+1,60 ' STROBE OFF
230 V=PEEK(A)
240 IF (PEEK(A+1) AND 128) THEN
RETURN ELSE 240
```



CAN YOUR DATA BASE REMEMBER HOW YOU DID IT LAST TIME?

CAN YOUR SECRETARY RUN REPORTS AND POST TRANSACTIONS USING YOUR DATABASE?

CAN YOU DEFINE AND SAVE REPORTS AND CALCULATIONS WITH RECORD SELECTION & SORT PARAMETERS?

THE DATABASE SYSTEM DESIGNED FOR BUSINESS

IS YOUR DATABASE ALL-IN-ONE INTEGRATED PACKAGE?

CAN YOU PRINT INVOICES AND STATEMENTS?

CAN YOU PRINT TRANSACTION SUMMARIES BY ACCOUNT?

CAN YOU SELECT, SORT, & PRINT FORM LETTERS & LABELS IN ONE OPERATION?

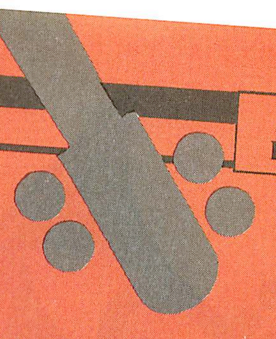
NEW!! FROM THE CREATORS OF HOMEBASE!!

ALL-IN-ONE INTEGRATED PACKAGE: DATABASE, SPREADSHEET, WORD PROCESSING & MAILMERGE

INTRODUCTORY PRICES: WORKBASE I $64.95 400 RECORDS —— WORKBASE II $79.95 1200 RECORDS

CALL TOLL FREE: 1-800-334-0854 (EXT 887)
OR SEND CHECK OR MONEY ORDER TO:

WORKBASE DATA SYSTEMS
P.O. BOX 3448, DURHAM, NC 27702



16K
ECB

# CoCo Classics

### By Tommy and Gail Pollock

Did you try "Bach to Basic" in the November 1983 issue? If so, your friends and relatives are, no doubt, in awe of your sudden musical ability. Maintain your new reputation with the following program, *CoCo Classics*.

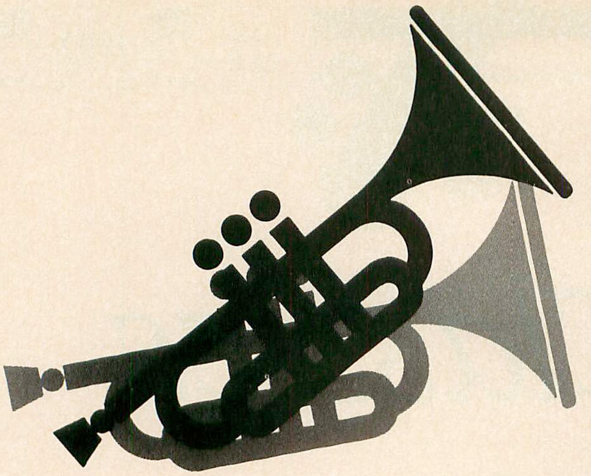
Spend a few minutes typing and have your computer play "Hornpipe" by Handel, "Sonatina" by Kuhlau, and "Toccata in D Minor" by Bach, complete with staccato notes, accents, and other marks of a true musician.

*CoCo Classics* requires 16K Extended Color BASIC. After *CLOAD*ing, type *RUN*, and a list of titles will appear. Enter the number of the selection you wish to hear first. At its conclusion, choose the same or another number, then acknowledge applause or sign autographs.

---

*(Tommy Pollock is an eighth-grader, a Senior League baseball player, and a drummer in his school band. His mother, Gail Pollock, is a published composer and instructor in economics and business at Gordon Junior College, Macon, Ga.)*

---



| | |
|---|---|
| 80 ......... | 4 |
| 182 ...... | 158 |
| 280 ....... | 36 |
| 370 ....... | 64 |
| 450 ....... | 74 |
| 520 ....... | 27 |
| END .... | 158 |

The listing:

```
0 CLS
1 GOSUB 510
8 'SONATINA
9 POKE 1344,50:POKE 1345,46
10 PLAY"P8T2O4L8CDEV25L4.FV15L8E
L4.DL8D#"
20 PLAY"V25L4.EV15L8DL4.CL8C"
30 PLAY"L16CO3BAGF#GABO4CDEFL16G
P16G"
40 PLAY"P16V10GP16GP16GP16GP16GP
16V10L16O3GABO4CDE":PLAY"V10L4.O
4FV10L8EL4.DL8DV10L4.GL8FL4.EL8E
V15L8FL16AGFEDCL8O3BL16O4BAGFEDL
8CO3BO4CO3BO4L4CP4V30O5L8CO4L16B
AGFEV25DCO3BAV20GFEDV15C"
50 PLAY"O2L8BBL16O3DCO2BO3CL4DP4
V30O5L8DL16O5CO4BAV25GFEDV20CO3B
AGV20FEDV15L16CP16CP16V10L16EDCD
V9L4EP8L16O4EP16EP16EP16L8EL16F#
G#L8AL4O5CL8O4A"
60 PLAY"BL4O5V10EV7O4L8BL16O5CDC
O4BL8AL16O5CO4BAGF#EDEFF#L8GL4BL
8GL8AO5L4DO4L8AL16BO5CO4BAL8GL16
BAV12GF#EDC#DEDCO3BAGF#GAG"
70 PLAY"F#ED#EF#G#ABO4CO3BAG#ABO
4CDEDCO3BO4CO3BAGF#GABO4CDEF#V30
L8GP8L8GP8L8GP8V10O3GAL2BL8BGAB"
80 PLAY"O4L2CV10L8CO3ABO4CV15L2D
L8EO3BO4CDV20L2EP8L8CDEL4.FL8EL4
.DL8D#L2V30EV20L16EP16EP16EP16EP
16"
90 PLAY"L4.EL8EL4.F#L8F#L2GL16GP
16GP16GP16GP16L4.GL8GL4.AL8AL2BL
16BP16BP16O5L8CC#"
100 PLAY"L2DL8L16DP16DP16L8E-EL2
FL16FP16EP16DP16CP16O4L8BP8AP8GP
8F#P8L4FP4EP4"
110 PLAY"L4FP4DP4O5L8CO4L16BAGFE
DCO3BAGFEDCO2L16BP16BP16O3L16DCO
2BO3CL4DP4O5L8DL16CO4BAGFEDCO3BA
GFED"
120 PLAY"L16CP16CP16EDCDL4EP8V5O
4L16EP16EP16EP16L8EL16F#G#L8AV10
O5L4CV5L8O4ABV10L4O5EV5O4L8BO5L1
6CDCO4BL8AO5L8V10CV5O4L16CP16CP1
6L8CL16DEL8FV10L4AV5L8F"
130 PLAY"L8GV10L4O5CV5O4L8GL16AB
-AGL8FP4V15L4O5DV10L8O4AL16BO5CO
4BAL8GP4V25L4O5GV20L8DL16EFEDL8C
L16EDV25CO4BAGF#GAGFEDCO3BO4CDC"
140 PLAY"O3BAG#ABO4C#DEFEDC#DEFG
AGFEFEDCO3BO4CDEFGABV30O5L8CP8DP
8EP4L16GFV25EDCO4BO5CDEDCO4BAGF#
GAG"
150 PLAY"FEDC#DEFEDECDO3BO4CO3AB
L4GP4P8O4L8EFDCL16EGO5CECO4GEO5C
O4GECGECL4O3GP4P8O4L8EFD"
160 PLAY"L8CL16EGO5CECO4GEO5CO4G
ECGECO3L4GP4P8O4L8EFDCP8CP8L2C"
170 GOTO 1
180 'HORNPIPE
181 POKE 1280,49
182 POKE 1281,46
190 FOR X=1 TO 2
200 PLAY"P8T4L2O3AO4DL16EF#EF#EF
#EF#L8F#P8L2DL8EP8F#P8DP8EP8L2AL
8EP8F#P8L16EP16DP16L8EP8L2AL8EP8
F#P8L16EP16DP16"
210 PLAY"L8EP8L2O3AO4L8AP8AP8AP8
L4AL8GF#L4GL8GP8GP8GP8L4GL8F#EL4
F#L8AP8AP8AP8L4AL8GF#L4GL8GP8GP8
GP8"
220 PLAY"T4L2.GL4AF#EF#GL16EF#EF
#EF#EF#EF#EF#L4DL4.DP8L2DEL8F#P8
L2DL8EP8F#P8L8DP8L8EP8L2AL8EP8F#
P8L16EP16DP16"
230 PLAY"L8EP8L2AL8EP8EP8O3AP8O2
L2AO3DEL8F#P8L2DL8EP8F#P8DP8EP8L
2AL8EP8F#P8L16EP16DP16L8EP8L2AL8
O4AP8AP8AP8"
240 PLAY"L4AL8GF#L4GL8GP8GP8GP8L
4GL8F#EL4F#O3L8AP8AP8AP8L4AL8GF#
L4GL8GP8GP8GP8L4GL8F#EL4F#L8O5DP
8DP8DP8"
250 PLAY"T4L4DL8C#O4BL4O5C#L8C#P
8C#P8C#P8L4C#L8O4BABO5DC#DO4BO5D
C#DL2.O4EL4EL2AL4AO5DL2C#L4O4BA"
260 PLAY"O4L2.AL8AP8AP8AP8L4GL8A
GL4F#L8AP8GP8F#P8L4F#L8EDL4EL8O3
AP8AP8AP8L4GL8AGL4F#L8AP8GP8F#P8
L4F#L8EDL4EL8O4AP8AP8AP8"
270 PLAY"O4L4AL8GF#L4GL8GP8GP8GP
8L2.GL4AF#EF#L8GP8L16F#EF#EF#EF#
EF#EF#L4DL2DP4L8AP8AP8AP8"
280 PLAY"L4AL8GF#L4GL8GP8GP8GP8L
```

# Saguaro Software

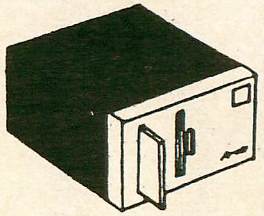
## MONTHLY SPECIALS

| | |
|---|---|
| Topsy Turvy | 12.00 |
| Stagecoach | 12.00 |
| Shaft | 14.00 |
| Jungle | 12.00 |
| Great Word Game | 12.00 |
| Bond Yield | 12.00 |
| Eight-Bit Bartender | 12.00 |

## Amdek Color I Plus

## $299

***Video Driver - $20 W/Purchase***



## Amdisk 3
## Amdek Dual 3" Disk Drive

## $475

Includes 2 Diskettes
And 2 Drive Cables
(One Amdek, One 5¼")

***First Box Of Diskettes - $45⁰⁰***

R.S. Controller - $135 With Amdisk 3

## GAMES

**PRICKLY-PEAR**

| | | |
|---|---|---|
| *Travelin' Toad | 32K | 18.75 |
| *Ockywoky | 32K | 18.75 |
| *Light Runner | | 18.75 |
| Jumbo Jet | | 18.75 |
| Color Disk Trivia | | 22.75 |
| Question Disk | | 14.75 |
| With Color Trivia | | 7.50 |
| Adventure in Wonderland | 32K | 18.75 |
| Decipher | | 18.75 |
| ERLAND | 32K | 18.75 |
| Flight | | 14.75 |
| Football | | 14.75 |
| Gangbusters | | 14.75 |
| Great Word Game | | 14.75 |
| Monsters & Magic | 32K | 14.75 |
| Naked Gamer | | 16.75 |
| Teeeofff | | 18.75 |
| Viking! | | 14.75 |

**TOM MIX**

| | | |
|---|---|---|
| *SR-71 | 32K | 22.75 |
| *The King | 32K | 20.75 |
| *Touchstone | 32K | 21.75 |
| *Junior's Revenge | 32K | 22.75 |
| Air Traffic Controller | Tape-32K | 21.75 |
| Buzzard Bait | | 21.75 |
| Cu*ber | | 21.75 |
| Journey to Mt. Doom (disk) | 32K | 21.75 |
| Space Shuttle | | 21.75 |

**PFA**

| | | |
|---|---|---|
| *Guillotine | | 7.75 |
| *Flasher | | 14.75 |
| Dunk-a-Duck | Tape | 14.75 |
| Inspector Clueseau | | 14.75 |
| Patti Pak | | 16.75 |
| Stagecoach | | 14.75 |
| **TYCOON** | Tape-32K | 14.75 |

**SUGAR**

| | | |
|---|---|---|
| Flying Tigers | 16K | 19.75 |
| Syntax Stories | | 8.75 |
| Silly Syntax | | 16.75 |
| 3" Diskettes | 10 for | $55 |
| Paper - 3,000 Sheets | | 32.75 |
| Paper - 500 Sheets | | 5.75 |
| Blank C-15 Tapes | | .75 |
| 100% Tested Disk SSDD 5 1/2"<br>10 Year Guarantee | Box of 10 | $20 |
| R.S. Disk Manual | | $17 |

**** Denotes New Programs***

## EDUCATION

**PRICKLY-PEAR**

| | | |
|---|---|---|
| Music Reader | | 26.75 |
| Phonics 1 or 2 (tape only) | | 18.75 |
| Prereader 1,2, &3 | | 18.75 |
| Spelling | | 37.75 |

**PFA**

| | | |
|---|---|---|
| Ed. Pack 123's, ABC,s, Big-Bigger | | |
| Biggest, Shapes | | 18.75 |
| Heart-Lung-Circulatory | | 26.75 |
| Medical Terminology | | 14.75 |

**SUGAR**

| | | |
|---|---|---|
| Bible Stories | | 21.75 |
| Great U.S.A. | | 15.75 |
| Prereader | | 15.75 |
| Presidents Of The U.S. | 16K | 19.75 |

## APPLICATIONS

**PRICKLY-PEAR**

| | | |
|---|---|---|
| Family Income Organizer (disk) | | 22.75 |
| *Colorcal | | 18.75 |
| Satellite Tracker | | 59.75 |
| Super Astrology | 32K | 18.75 |

**PFA**

| | | |
|---|---|---|
| Super Bowling Secretary | 32K | 19.75 |
| Hurrican Tracker | | 11.75 |
| Stress Evaluator | | 18.75 |

**SUGAR**

| | | |
|---|---|---|
| Co-Co Calligrapher | 32K | 19.75 |

## UTILITY

| | | |
|---|---|---|
| Filmastr | | 23.75 |

**PRICKLY-PEAR**

| | | |
|---|---|---|
| Clone Master | Tape-32K | 29.75 |
| Color Kit | | 26.75 |
| Tape Omni Clone (tape) | | 22.75 |
| Super Scroll | 64K | 18.75 |
| Rom Free | 64K | 18.75 |
| Modem Master | 16K | 18.75 |

**PFA**

| | | |
|---|---|---|
| Super Disck Utility (disk) | | 35.75 |
| *Master Graphics Tool Kit | 32K | 29.75 |

**SAGUARO**

| | | |
|---|---|---|
| Move-it! | | 15.95 |

**SUGAR**

| | | | | |
|---|---|---|---|---|
| Auto Run | | 15.75 | Tim's | 20.75 |
| Semigraf | 32K | 15.75 | Tim's Mail | 15.75 |

**Add $3.00 For Disk, $6.00 For Amdisk**

## *NEW FROM SAGUARO SOFTWARE*

## Co-Co Receivables

Keep track of all those accounts with current list of accounts, statement printing, last activity date, and current month's transactions, debits & credits. Disk storage of data. 32K disk. $29.95.

## Ultimate Bingo & Jackpot

Do you want the ultimate in bingo? Use your LP7 or 8 to print the number of cards you desire. You can choose from 3 speeds & even pause the game to check the winner.

### Jackpot

Pull the one arm bandit's arm & see if you can beat the odds.

Both Only:
**Tape - 19.95 Disk - 24.95**
**Amdek - 29.95**

## NNFUSICOO CONFUSION

3 modes of play. 3-4/5-6/7 letter words. You select time to govern how long (30 or 60 seconds) to unscramble the words. First person with ten correct wins. 1-4 can play.

**Tape - 19.95 Disk - 24.95**
**Amdek - 29.95**

## Co-Co Keno

Bring Las Vegas' Keno game home with Co-Co Keno. Bet $1, $3, or $5 & mark off 1 to 15 spots...can you beat the odds & win $50,000? 16K, high resolution screen. Keno chart print included.

**Tape - 24.95 Disk - 29.95**
**Amdek - 34.95**

## Loveless Manor

Trapped in a bedroom by your evil aunt, you've admired Queen Cinderella's castle in the distance...and you've just discovered she's a distant cousin. Can you escape to her protection? 32K.

**Great Word Adventure**
**Tape - 19.95 Disk - 24.95**
**Amdek - 29.95**

MasterCard

Arizona Residents Add 7% Tax • Add $1.00 Per Program For Shipping ($4.00 Maximum) - Dealer Inquiries Welcome • Some Quantities Limited • Ask About Royalties

VISA

**7331 E. Beverly - Tucson, AZ 85710 - (602) 885-6508**

```
2.GL4AF#EF#GL16F#EF#EF#EF#EF#EF#
EL4DL1DP2"
290 IF X=2 THEN GOTO 1 ELSE GOTO
 300
300 PLAY"L8O4F#P8DP8O3BP8O4F#P8F
#P8F#P8L4F#L8EDL4EL8EP8EP8EP8L4E
L8DC#L4DL8DP8DP8DP8L4DL8GF#EF#DE
C#DO3BO4C#O3A#O4C#O3BO4C#O3A#O4C
#O3BO4C#O3F#O4F#EF#DF#EF#DEC#DO3
BO4BAB"
310 PLAY"T4O4GABAGAF#GEF#DEC#DED
C#DO3BO4C#O3AO4AGAL4F#L8BAL4G#L8
BAG#AF#G#L4E#L8C#P8L16C#P16DP16L
8C#P8L16C#DC#DC#DO3BO4C#"
320 PLAY"L4F#L8C#P8L16C#P16DP16L
8C#P8L16DC#DC#DC#DO3BO4C#L4G#L8C
#P8L16C#P16DP16L8C#P8L16C#DC#DC#
DO3BO4C#"
330 PLAY"L4O4AL8C#P8L16C#P16O4DP
16L8C#P8AP8C#P8L4G#L8O4ABL4O3BL8
BP8BP8BP8L4O4G#L8ABL4O3BL8BP8BP8
BP8L2.O4E#L4C#L2F#L4F#G#L16G#AG#
AG#AG#AG#AG#AL4F#"
340 PLAY"L8O3A#O4C#O3BO4C#O3A#O4
C#O3BO4C#O3F#O4F#EF#D#F#EF#D#EC#
D#O3BO4BABG#ABAG#BABEF#DEC#DL4EL
8O3AO4AG#AEAG#AF#AG#ADBABL8EP8EP
8"
350 PLAY"L4O4A#L8BO5C#O4L4EL8EP8
EP8EP8L4A#L8BO5C#L4O4EL8EP8EP8EP
8L2.A#L8G#F#L4BL8AGF#GL8EP8L2DL1
6C#DC#DC#DL8O3B"
360 PLAY"L8O3BP8L4O4BO3BO4L8BP8B
P8L16AP16GP16L8AP8L4AL4O3AL8O4AP
8AP8L16GP16F#P16L8GP8L4BO3BO4L8B
P8BP8L16AP16GP16L8AP8L4AO3L4BL8O
4AP8AP8L16GP16F#P16"
370 PLAY"L4O4GF#F#EEDDCCO3BBA#L2
.A#O4L4GL2F#L4F#GL2DL4C#O3BL1BP2
"
380 NEXT X
390 GOTO 1
399 'TOCCATA
400 POKE 1376,51:POKE 1377,46:PL
AY"P8T2L16O4AGL2AP8L16GFEDL8C#P8
L2DP4P8O3L16AGL2AP8L8EFC#L2DP4P8
O2L16AGL4AP4L16GFEDL8C#P8L2DP2O1
L8DO2C#EGB-O3C#L4EL2DP4P8"
410 PLAY"T3O3L8C#L12DEC#DEC#DEC#
L16DP16EP16L12FGEFGEFGEL16FP16GP
16L12AB-GAB-GAB-GL4AP2P4P5P8L8O4
C#L12DEC#DEC#DEC#L16DP16EP16L12F
GEFGEFGEL16FP16GP16L12AB-GAB-GAB
-GL4AP2P4P5P8"
420 PLAY"L8O4AL12GB-EGB-EFADFADE
GCEGCDFO3B-O4DFO3B-"
430 PLAY"T3L12O4CEO3AO4CEO3AO3B-
O4DO3GB-O4DO3GAO4CO3FAO4CO3FO3GB
```

# ARE YOUR WALKING FINGERS GETTING FOOTSORE?

Tired of typing in those long, but wonderful, programs from issues of **THE RAINBOW**? Now, you can get **RAINBOW ON TAPE** and give those tired fingers a rest. With **RAINBOW ON TAPE**, you'll be able to spend your time enjoying programs instead of just typing . . . typing . . . typing them! All you need to do ever again is pop a **RAINBOW ON TAPE** cassette into your recorder, *CLOAD* and *RUN* any one you want.

Think of it! Not 10 or a dozen — but between 20 and 30 — programs every month from **RAINBOW ON TAPE**. All the really good programs from **THE RAINBOW**! All the long ones . . . so you don't have to type them in. Just *CLOAD* and *RUN*!

**Now...The Best Color Computer Magazine Offers The Best Tape Service**

**RAINBOW ON TAPE** single issue rate is: within the US, $8, Canadian and Mexican rate, $10, all other countries, $10.00
**RAINBOW ON TAPE** subsrciption rate is: within the US, $70, Canadian and Mexican rate, 80, all other countries, $95.

**US FUNDS ONLY PLEASE**

VISA, MasterCARD and American Express accepted. All subscriptions begin with the current issue and back issues are available beginning with April, 1982. Tapes are sent first class mail to arrive approximately the same time as your current issue of **THE RAINBOW**.

**ORDER RAINBOW ON TAPE TODAY!
HANDY ORDER CARD BETWEEN PAGES 34 & 35**

```
-EGB-EFADFADEGC#EGC#L4O1DL2O3B-L
16B-AGFEDC#O2BO3L8C#O2AO3C#L16EG
L16FGFGFGFGFGFGFGL8EL2F"
440 PLAY"T3P4P8L16AO4DO3AO4EO3AO
4FO3AO4DO3AO4EO3AO4FO3AO4GO3AO4E
O3AO4FO3AO4GO3AO4AO3AO4FO3AO4GO3
AO4AO3AO4B-O3AO4GO3AO4AO3AO4FO3A
O4GO3AO4EO3AO4FO3AO4DO3AO4EO3AO4
C#O3AO4DO3AAAB-AGAAAFAGAEAFADAGA
EAFADAEAC#A"
450 PLAY"T3T3L16O3DAO2AO3AO2B-O3
AO2GO3AO2AO3AO2FO3AO2GO3AO2EO3AO
2FO3AO2DO3AO2GO3AO2EO3AO2FO3AO2D
O3AO2EO3AO2C#O3AO2L8DP8L16O3DFB-
FCEAEO2B-O3DGDO2AO3C#EAL8DB-O2AO
3AO2B-O3G"
460 PLAY"L8O3AP8L16DFB-FCEAEO2B-
O3DGDO2AO3C#EAL8DB-O2AO3AO2B-O3G
L4AL16AGFEDC#O2BO3C#O2ABO3C#DEFG
AGFEFDFAO4C#"
470 PLAY"L16DO3ABO4C#DEL32FGL16A
L4B-L8DB-O3AO4AO3B-O4GL4AL16DFB-
FCEAEO3B-O4DGDO3AO4C#EAL8DB-O3AO
4AO3B-O4GL4ADL4.C#L8O3BO4C#L16EG
L8B-L16AGFEFEDC#DCO3B-AGFEDL1O4E
"
480 PLAY"T4L12O4C#EC#O3B-O4C#O3B
-O4C#EC#O3B-O4C#O3B-O4C#EC#O3B-O
4C#O3B-O4C#EC#O3B-O4C#O3B-GB-GEG
EGB-GEGEGB-GEGEGB-GEGEC#EC#O2B-O
3C#O2B-O3C#EC#O2B-O3C#O2B-O3C#EC
#O2B-O3C#O2B-O3C#EC#O2B-O3C#O2B-
O3C#EC#EGEC#EC#EGE"
490 PLAY"T4L12O3C#EC#EGEC#EC#EGE
GB-GB-GB-GB-GB-GB-O4C#O3B-O4C#EC
#EC#EC#EC#ET3L4AP4AP4L2GP4L8O2AG
L4.AL8EFDEC#DO1BO2C#O1AB-G#AO4C#
L4DO3FL32FEFEFEFEL4EL1D"
500 GOTO 1
510 CLS(RND(8)):PRINT@320,"2. SO
NATINA, OPUS 55,NO.3/KUHLAU";
520 PRINT@256,"1. HORNPIPE FROM
'WATER MUSIC'/     HANDEL"
530 PRINT@352,"3. TOCCATA IN D M
INOR/BACH"
540 PRINT@416,"CHOOSE ONE PLEASE
";
550 PRINT@12,"CLASSICS";
560 PRINT@38,"ARRANGED FOR THE C
OCO";
570 PRINT@79,"BY";
580 PRINT@104,"TOMMY L. POLLOCK"
;
590 PRINT@143,"AND";
600 PRINT@169,"GAIL L. POLLOCK";
610 PRINT@224,"SELECTIONS:";
620 I$=INKEY$:IF I$="1" THEN 180
 ELSE IF I$="2" THEN 9 ELSE IF I
$="3" THEN 400 ELSE GOTO 620
630 GOTO 630
```

# Tax Relief

**With Coco-Accountant II**

Were your taxes a mess this year? Then you need CoCo-Accountant II. This 32Khome and small business accounting program is all you need to keep track of yourfinances and make income tax time a breeze! Spend a few minutes with your canceled checks, credit card slips and payroll stubs. When you're through, Coco-Accountant II will list and total expenditures and income by month, account or payee, provide a year-to-date summary by account and figure your net cash flow. It even prints a spreadsheet showing your year at a glance.

The program lists most functions to screen or printer and saves files to tape or disk. Special features flag tax-deductible expenditures and payments subject to state sales tax. It even computes the sales tax you paid! CoCo-Accountant II will alsobalance your checkbook and print a monthly reconciliation statement. Up to 450 entries per file on 32K tape, 900 on 64K tape or disk. All this for only $27.95,tape or disk.

**New From Owl-Ware!**

new STELLAR SEARCH 32K only

This amazing 32K graphics adventure was the hit of Rainbowfest, and now it TALKS! More than 86K of exciting action in four programs as you pilotthe Enterprise through space in search of an alien race. Seeing is believing, and if you have a speech synthesizer (tell us which one), you can hear it, too! Talking version is $26.95 on tape, $29.95 on disk. Original Stellar Search now only $24.95 on tape, $26.95 on disk.

**Disk Drive Special!**

An incredible disk drive bargain. Choose from famous manufacturer's 35 or 40 track disk drives. Tough, reliable equipment for your Color Computer, complete with power supply and case. Our 35-track drives are only $164.95, our 35 track drives just $174.95. Add $5.00 for shipping.

MasterCard

**Federal Hill Software**
**825 William St.**
**Baltimore, MD 21230**

VISA

301-685-6254

# RAINBOW Info

## How To Read Rainbow

Please note that all the BASIC program listings you will find in *the Rainbow* are formatted for a 32-character screen — so they will show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match — and your line endings come out the same — you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, *do* read the text before you start typing.

Finally, the little cassette symbol on listings indicates that program is available through our *Rainbow On Tape* service. An order form for this service is on the insert card bound in the magazine.

---

RAINBOW
CERTIFICATION
SEAL

## The Rainbow Seal

The Rainbow Certification Seal is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product which carries the Seal has been physically seen by us and that it does, indeed, exist.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to *the Rainbow* for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal. This lets you know that we have seen the product and that it does, indeed, exist.

The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is right for your needs.

There is absolutely no relationship between advertising in *the Rainbow* and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to *any* commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

## Using Machine Language

Machine Language programs are one of the features of *the Rainbow*. There are a number of ways to "get" these programs into memory so that you can operate them.

The easiest way is by using an Editor-Assembler, a program you can purchase from a number of sources.

An editor-assembler allows you to enter mnemonics into your CoCo and then have the editor-assembler assemble them into specific instructions that are understood by the 6809 chip that controls your computer.

When you use an editor-assembler, all you have to do, essentially, is copy the relevant instructions from *the Rainbow's* listing into CoCo.

Another method of getting an assembly language listing into CoCo is called "hand assembly." As the name implies, you do the assembly by hand. This can *sometimes* cause problems when you have to set up an ORIGIN statement or an EQUATE. In short, you have to know something about assembly to hand assemble some programs.

Use the following program if you wish to hand assemble machine language listings:

```
10 CLEAR200,&H3F00:I=&H3F80
20 PRINT "ADDRESS:";HEX$(I);
30 INPUT "BYTE";B$
40 POKE I,VAL("&H"+B$)
50 I=I+1:GOTO 20
```

This program assumes you have a 16K CoCo. If you have 32K, change the &H3F00 in Line 10 to &H7F00.

---

## What's A CoCo

CoCo is an affectionate name which was first given to the TRS-80 Color Computer by its many fans, users and owners. As such, it is almost a generic term for three computers, all of which are very much alike.

When we use the term CoCo, we refer to the TRS-80 Color Computer, the TDP System-100 Computer and the Dragon-32 Computer. It is easier than using the three "given" names throughout *the Rainbow*.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and TRS-80 Color are, for all purposes, the same computer in a different case, these terms are almost always interchangable.

## Rainbow Check PLUS

The small boxes that you see accompanying programs in the *Rainbow* "Check system," which is designed to help you type in programs accurately.

*Rainbow Check PLUS* will count the number and values of characters you type in. You can then compare the numbers you get to those printed in *the Rainbow*. On longer programs, some benchmark lines are given. When you reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use *Rainbow Check PLUS*, type in the program and *CSAVE* it for later use, then type in the command *RUN* and press [ENTER]. Once the program has run, type *NEW* [ENTER] to remove it from the area where the program you're typing in will go.

Now, whenever you press the down arrow key, your CoCo will give you a checksum based on the length and content of the program in memory. This is to check against the numbers printed in *the Rainbow*. If your number is different, check the listing carefully to be sure that you typed in the correct BASIC program code. For more details on this helpful utility, refer to H. Allen Curtis' article on page 21 of the February 1984 *Rainbow*.

Since *Rainbow Check PLUS* counts spaces and punctuation, be sure to type in the listing exactly the way it's given in the magazine.

```
10 CLS:X=256*PEEK(35)+178
20 CLEAR25,X-1
30 X=256*PEEK(35)+178
40 FOR Z=X TOX+77
50 READ Y:W=W+Y:PRINT Z,Y;W
60 POKE Z,Y:NEXT
70 IFW=7985THEN80ELSEPRINT
   "DATA ERROR":STOP
80 EXEC X:END
90 DATA 182,1,106,167,140,60,134
100 DATA 126,183,1,106,190,1,107
110 DATA 175,140,50,48,140,4,191
120 DATA 1,107,57,129,10,38,38
130 DATA 52,22,79,158,25,230,129
140 DATA 39, 12, 171,128,171,128
150 DATA 230,132,38,250,48,1,32
160 DATA 240,183,2,222,48,140,14
170 DATA 159,166,166,132,28,254
180 DATA 189,173,198,53,22,126,0
190 DATA 0,135,255,134,40,55
200 DATA 51,52,41,0
```

# Federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10

## Mon CoCo Parle Francais! Mi Coco Habla Espanol!

These delightful 16K Extended Basic Programs will teach your youngster a basic Spanish or French vocabulary! Each language package contains two programs with a total of 1,000 words in a colorful game format that teaches children to think as well as memorize. They'll have great fun as they watch the letters hop across the screen and slip into place. Perfect for home or classroom. We even include a list of the vocabulary words for study guides or lesson plans! Spanish or French, only $24.95 on tape, $26.95 on disk. Both languages only $39.95 tape or disk.

## Use All 64K!

Did you feel gypped when you found out your 64K Color Computer only had 32K of memory in BASIC? We sure did! So we invented HID 'N RAM, the most powerful 64K programming tool on the market. With HID 'N RAM you can access that hidden 32K of memory from basic and use it to store and sort your data. Write a 28K program with every bell and whistle you can think up and still have more than 30K left to store the names, addresses or numbers you're crunching. We've even thrown in a machine language sort routine! HID 'N RAM is a brief ML driver embedded in a Basic demonstration program—a mailing list that stores 500 names in RAM. This shows you how it works. Then you can delete our program and write your own. The machine language stays with you! HID 'N RAM comes with complete instructions and programming guide. Only $24.95 on tape, $27.95 on disk.

## The Handicapper

Now available for all CoCo's, Model 100's and MC-10s! Use the power of your computer to improve your performance at the track! Forget about arcane horse picking systems. Let The Handicapper do it for you! Separate programs for thoroughbred and harness tracks apply sound handicapping principles to rank the horses in each race. With data readily available from the thoroughbred Racing Form or harness track program, you can evaluate a whole card in half an hour!

Factors include speed, distance, track condition, post position, past performance, jockey or driver's record, stretch gain and other factors. Easy for the beginner, sophisticated enough for the veteran! Thoroughbred or Harness Handicapper, $24.95 each on tape, $27.95 on CoCo disk. Both programs only $39.95 tape or disk. State computer type and memory when ordering.

## Baseball Statpak

Whether you're in Little League, Pony League, high school or a company softball league, your players will love these Big League statistics. Keep track of 180 hitters—AB, Hits, Avg., RBI, HR, SO, Walks, and lots more. Pitching records include Won, Lost, PCT., IP, ER, ERA, SO, BB, and HR. Team records and standings, too! Superfast sort by any stat for incredible screen displays and printouts. You've seen these stats in the newspapers—now produce them for your players. Package of three programs, only $28.95 on 16K tape, $31.95 on 32K disk. Requires Ext. Bas.

## Greyhound Handicapper

NEW GREYHOUND HANDICAPPER! Written by a former greyhound trainer, this program puts the most sophisticated techniques at your disposal. Quickly and easily rates the dogs using speed, class, favorite box, kennel performance, breaking ability and other factors. A special feature shows recommended quinella, exacta and trifecta plays. List rankings to screen or printer. For CoCo only, $24.95 on tape, $27.95 on disk.

VISA

**Federal Hill Software**

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10

MasterCard

825 William St. Baltimore, Md. 21230 301-685-6254

We accept checks, money orders, Visa and Master Card. Add $1.50 for shipping and handling of software, $5.00 for disk drives. Credit Card orders should include card number, exp. date and signature.

# A CHALLENGING WORD GAME

# BANDY

Do you like to toss words around? Would you like to become a superstar or maybe even the greatest? If so, then *Bandy* is the game for you.

*Bandy* is a word game of skill and strategy. The aim of *Bandy* is to provide challenging entertainment. After considerable practice you may expect to attain scores in the 400 to 500 range. If you are exceptional and apply optimal strategy, you may even reach the 600 point level.

*Bandy* requires Extended Color BASIC and can be played on cassette or disk-based systems with 16K or 32K RAMs. You may save unfinished games on tape or disk.

The mechanics of playing *Bandy* and the rules of word formation and scoring will be presented in detail. You may prefer to glance over them or even skip them entirely until you have experimented with the game.

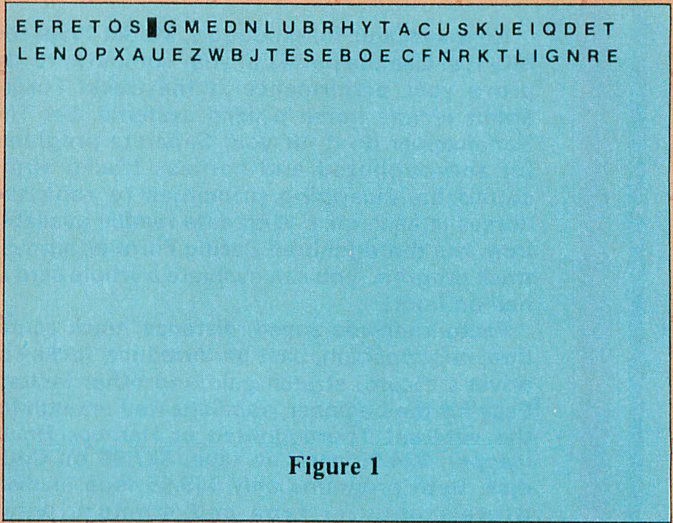
**The Mechanics**

You play the game by forming interconnecting words crossword-like on the *Bandy* board. Each letter in every word you form adds one point to your score. Also, you can earn bonuses for forming words more than six letters long.

Turn by turn you form words on the board by selecting letters from a "play-line" of letters. After each turn, the play-line is replenished with letters from a 63-letter "supply."

Having the *Bandy* letter supply in full view and knowing the order in which letters will be available for play lets you plan strategy for turns in advance.

The letter supply occupies the top two lines of your CoCo



```
E F R E T O S █ G M E D N L U B R H Y T A C U S K J E I Q D E T
L E N O P X A U E Z W B J T E S E B O E C F N R K T L I G N R E
```

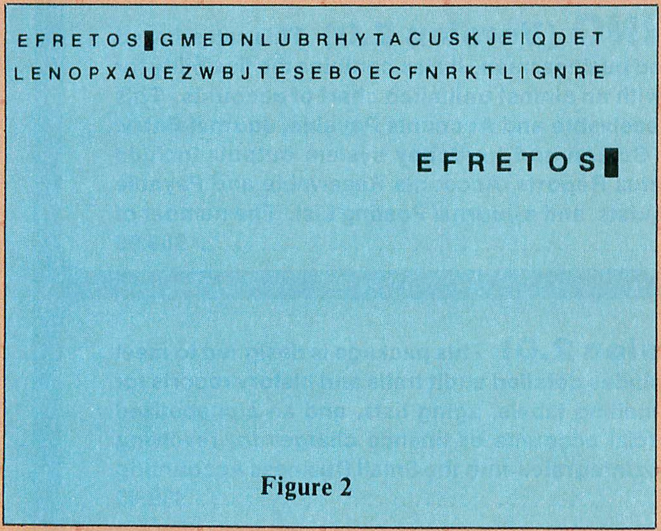
Figure 1

---

*(H. Allen Curtis resides in Williamsburg, Va. He is interested in 17th and 18th century history and enjoys biking through the colonial capital. He balances past and present with his computer work.)*

screen. A blue marker separates the letters that have been sent to the play-line from those that will be sent. Figure 1 shows an example letter supply as it would be located in a game of *Bandy*.

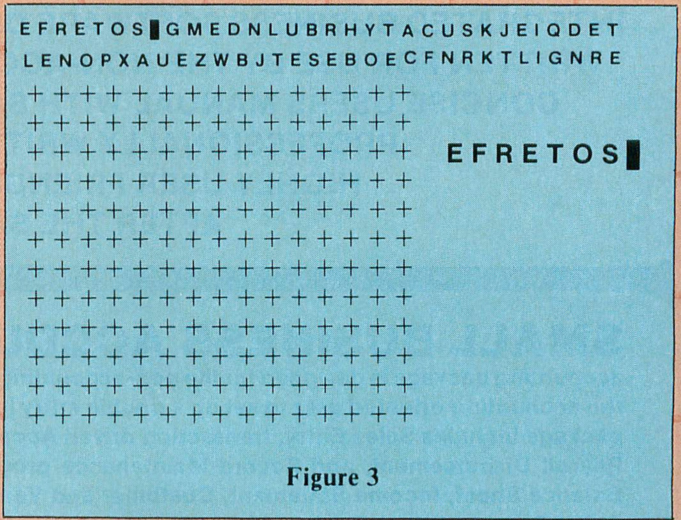
The play-line is an eight-position line of letters located right of center of the screen and below the letter supply. The first seven positions contain letters from the letter supply and the eighth position contains a red marker. The eighth position is called the choice position because you may choose any letter to replace the red marker. Figure 2 shows an example of the play-line and the letter supply locations.



```
EFRETOS█GMEDNLUBRHYTACUSKJEIQDET
LENOPXAUEZWBJTESEBOECFNRKTLIGNRE

                         EFRETOS█
```

Figure 2

The *Bandy* board occupies most of the left half of the screen. It consists of 180 spaces and each space is designated by a plus sign. The board has 12 rows and 15 columns. Thus, a 15-letter word is the largest you can form across. A 12-letter word is the longest you can form down. Figure 3 shows the *Bandy* board relative to the letter supply and the play-line.



```
EFRETOS█GMEDNLUBRHYTACUSKJEIQDET
LENOPXAUEZWBJTESEBOECFNRKTLIGNRE
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +    EFRETOS█
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
+ + + + + + + + + + + + + + +
```

Figure 3

At the start of the game the cursor is found at the top left space of the board. At the beginning of each turn move the cursor to the position you wish to start forming a word. You control cursor movement by typing the direction arrow keys: left, right, down and up.

After you have moved the cursor to the desired starting position and are ready to form a word, type 'A' or 'D' depending on whether you wish to form the word across (from left to right) or down (from top to bottom). As you type 'A' or 'D' the word, across or down, will be displayed below the play-line.

If you type a letter other than 'A' or 'D' when neither across nor down is displayed, an alarm will be given. The alarm is in the form of help instructions summarizing the correct order of play.

To place a letter from the play-line at the cursor position of the board, merely type that letter. After the letter has been placed, the cursor will automatically move to the next available position to the right or towards the bottom, depending

### BY H. ALLEN CURTIS

# THE COLORSOFT™ BUSINESS SYSTEM

INTEGRATED BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER
WRITTEN FOR USE BY THE NON-ACCOUNTING ORIENTED BUSINESSMAN
CONCISE USERS MANUAL WITH SAMPLE TRANSACTIONS TUTORIAL
PROFESSIONALLY WRITTEN AND FULLY TESTED
HIGHLY USER FRIENDLY AND MENU DRIVEN
AFTER THE SALE SUPPORT

**SMALL BUSINESS ACCOUNTING (Version 2.0)** This sales-based accounting package is designed for the non-accounting oriented businessman. It also contains the flexibility for the accounting oriented user to set up a double entry journal with an almost unlimited chart of accounts. This package includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. Screen and hardcopy system outputs include Balance Sheet, Income Statement, Customer and Vendor Status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List. The number of accounts is limited only by the number of disk drives. .......................................... $89.95

**ACCOUNTS RECEIVABLE (Version 2.0)** This package is designed to meet the requirements of most small business users. The system includes detailed audit trails and history reports for each customer, prepares invoices and monthly statements, mailing labels, aging lists, and an alphabetized customer listing. The user can define net terms for commercial accounts or finance charges for revolving accounts. This package functions as a standalone A/R system or integrates with the Small Business Accounting package to build a complete accounting/receivables system. .................................... $59.95

**PAYROLL (Version 2.0)** This integratable package is designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. This system calculates payroll and tax amounts, prints checks and maintains year-to-date totals. These amounts can be automatically transferred to the SBA package for financial reporting. It computes each pay period's totals for straight time, overtime, and bonus pay and determines taxes to be withheld. Additional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. This system is suited for use in all states except Oklahoma and Delaware. ...................................................... $69.95

All programs require a minimum of 32K and 1 disk drive but will take advantage of 64K and multiple drives. Each package features a hi-res 51 x 24 black on green screen. 16K versions available without hi-res screen. Specify 16K or 32K versions when ordering. Future integrated packages will include: Inventory Control, Sales Analysis, Accounts Payable.

INCLUDE $5.00 Shipping/Handling Per Order

Write for Free Catalog

---

**BRANTEX, INC.**
COLOR SOFTWARE SERVICES DIV.

BUSINESS SOFTWARE GROUP
P.O. BOX 1708
GREENVILLE, TEXAS 75401

BRANTEX

TELEPHONE ORDERS
(214) 454-3674
COD/VISA/MASTERCARD

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE on whether you are forming a word across or down. Above the play-line letter just placed on the board will appear a minus sign to indicate that the letter has been "played."

Even if a letter appears in only one position of the play-line, it can be played as many times as you need to use it in forming a word during a turn. This greatly enlarges the possibilities for words to be formed. After you complete the turn, all played letters will be replaced with letters from the letter supply.

There are two ways of completing a turn. Usually you complete a turn, after forming a word, by pressing the ENTER button. A turn is automatically completed when there is no available space for the cursor to move to the right or down for an across or down formed word.

To place a letter in the "choice" position of the play-line you must do the following: When neither across nor down is displayed depress the Space Bar. This will cause the cursor to replace the red marker. When you see the cursor there, type the letter of your choice and it will appear in the choice position. The letter will be "reversed," that is, it will be green with a dark background.

The reversed letter is placed on the board in the same way as any other play-line letter. Do *not* switch to the "upper-lowercase" mode to play the reversed letter! Also, like the other play-line letters, it may be played as many times per turn as is needed. The chosen letter will be replaced by the red marker when the turn is over.

While across or down is displayed, the direction arrow keys can *not* be used to control the cursor. This does not mean that if you made a mistake in forming a word that you are "stuck" with it. You may erase a completed turn by pressing the CLEAR key. After completing a turn, you may see that you would have scored better by playing the turn differently. In such a case, erase the turn and replay it.

A beep alarm is sounded when you make certain illegal moves such as pressing the Space Bar when there is a letter in the choice position or typing a character not on the play-line when across or down is displayed.

The game automatically ends after the letter supply is exhausted. You may also terminate the game prematurely as follows: when neither across nor down is displayed, you can end the game by typing the '@' key.

When the game is terminated, you are given five options:

1) To replay the game that you just finished.
2) To play a game with another letter supply.
3) To end the program.
4) To save your game on disk or tape.
5) To view screen of just completed game.

At the very beginning of the game if the letter supply is not to your liking, merely press ENTER to change it.

At the start of *Bandy* you are asked whether you have a previously saved game to load. If you answer by typing 'Y', the program will load the game and set it to start at the point that you discontinued it.

**Rules For Word Formation**

Now that you know the mechanics of play, you need to know how to interconnect and modify words to form new words. The rules for forming words are as follows:

1) On your first turn, anywhere on the board form any valid dictionary word consisting of two or more letters.

2) Form a valid dictionary word by adding one or more letters to a word already on the board. The letter or letters can be added at the beginning, the end, or both the beginning and end of a word already on the board.

3) Form a valid dictionary word by adding one or more letters at right angles to an existing word. The letter or letters can be added at right angles to either side or both sides of the existing word. If one of the letters adds to the beginning or end of the existing word, another new word is formed. It also must be a valid dictionary word and you will be given credit for both words formed.

4) Form a valid dictionary word adjoining or parallel to an existing word so that all adjoining letters form valid dictionary words. You receive credit for all words formed.

5) Form a valid dictionary word that touches no other word. This word like all other words must consist of at least two letters.

To crystallize in your mind the foregoing rules, some examples will now be presented.

**Example 1:** Suppose the word "FRIEND" is on the *Bandy* board, and the letters L, N, U and Y are among those on the play-line. You could, according to rule 2, add "LY" to the end of "FRIEND" to form the word "FRIENDLY." Better yet, you could add "UN" to the beginning of "FRIEND" and "LY" to the end of "FRIEND" to form the word "UNFRIENDLY" in one turn. It has been assumed that there were available spaces at the places where the letters were played. Similar assumptions will be made in the ensuing examples.

**Example 2:** Suppose the word "ARK" is on the board and the letters I, N, E, D are on the play-line. By rule 3, you could form the word "INKED" by adding at right angles to "ARK" the letters I and N before K and the E and D after K. By rule 3, you could form two words, "DINE" and "DARK." If "ARK" had been across, the result of taking your turn could have been:

```
D A R K
I
N
E
```

**Example 3:** Suppose the words "FLOWER" and "TENT" are on the board as shown:

```
  F
  L
  O
  W
T E N T
  R
```

Also, suppose the letters A, T and I are on the play-line. According to rule 4, the words "AWAIT," "AT," "AN" and "IT" can be formed. The result of playing according to rule 4 would be:

```
  F
  L
  O
A W A I T
T E N T
  R
```

After each turn, a new display temporarily replaces the game playing screen. The new display lets you see more easily whether or not you followed the rules of word formation. The display will list every word you formed during the just completed turn. If you see that any of the listed words are not valid, you should erase the turn and play it correctly.

### Scoring

Your score will be automatically counted and tabulated after each turn. Nevertheless, to decide the best way to play a turn you should know the point counts of words of all lengths. Point counts are as shown in Table 1:

| LETTER COUNT | +BONUS | = POINT COUNT |
|---|---|---|
| 2 | 0 | 2 |
| 3 | 0 | 3 |
| 4 | 0 | 4 |
| 5 | 0 | 5 |
| 6 | 0 | 6 |
| 7 | 5 | 12 |
| 8 | 10 | 18 |
| 9 | 15 | 24 |
| 10 | 25 | 35 |
| 11 | 35 | 46 |
| 12 | 45 | 57 |
| 13 | 60 | 73 |
| 14 | 75 | 89 |
| 15 | 90 | 105 |

**Table 1**

*Bandy* is written in a combination of BASIC and machine language. The machine language part of the program is stored in the 919 byte RAM area immediately after the BASIC part and immediately before the memory area where BASIC variables are stored. To free the 919 byte RAM area you must do the following: just after you have turned on *7,3+PEEK(27):POKE 28,154* and press ENTER.

Aurora Computing

49 Brookland Ave., Aurora, Ontario Canada L4G 2H6

**FAMILY GAMES**

The popular **STOCKBROKER** and **CRIBBAGE 32K** .......................................... $14.95 each.

**ADVENTURE GAMES:** Sea Quest and Shenanigans from MARK DATA .............. only $24.95(C); $27.95(D) each

From BRANTEX, **PIRATE TREASURE 16K** ......... $13.95

**SCAVENGER HUNT 16K** ......................... $18.95

**EDUCATIONAL GAMES**

**COLORMIND, CONCEN** - improve your memory and logical thinking - **16K** .............................. $10.95 each

• • •

Also from **BRANTEX**

**EDU-COMBO** (Math Derby, Peek 'N' Spell Metric Converter) **16K** .......................................... only $29.95

BUSINESS: **HOUSEHOLD EXPENSE MANAGER 16K** $19.95

**LOAN ANALYSIS 16K** .......................... $20.95

• • •

**NEW** from **MARK DATA**

The amazing **TIME FIGHTER 16K** ............. $24.95(C)
**32K** ............................ $27.95(D)

Also the ever popular **GLAXXONS 16K** ......... $24.95(C)
**32K** ............................ $27.95(D)

• • •

UTILITIES: **ROMDISK:** Run your rom pack games from a disk! **64K** .......................................... $15.95

**MR. COPY** - make up to 99 copies of one program at once! **16K** .......................................... $15.95

To *POKE* the machine language part of *Bandy* into the freed area, type and run the BASIC program of Listing 1. When that program runs to completion without an error message, as a precautionary measure save it on tape or disk.

After saving the program of Listing 1, rid it of its BASIC constituent by doing the following: Type "DEL0-" and press ENTER. Now there remains the machine language portion of *Bandy* upon which to build the BASIC part.

Next, type the BASIC part of *Bandy* as shown in Listing 2. When you have typed it correctly, *Bandy* will be complete. Save it on tape or disk.

Besides being able to save a partially finished game of *Bandy* for later completion, you can save a completed (letter supply exhausted) game or a game you have not even started. You may wish to save a completed game and replay it at a later time to see whether you can improve on your previous score.

When a completed game is loaded, you will not be able to see it immediately. You will have to wait for the option screen to appear. When you take the viewing option, you will see the completed game, but you will not be able to take any more turns. Note the plus at the right of your score, this is *Bandy's* completed game marker.

There is a warning that should be noted concerning the saving of games on disk. If you have already saved a game on a disk and then save another, the second will overwrite the first.

If you wish, you may even construct your own letter supply and play a game of *Bandy* with it. Here's how:

1) *RUN Bandy.*
2) When requested, type your name.
3) Type 'N' when asked about a saved game.
4) Press ENTER when the *Bandy* board is displayed.
5) Press the BREAK key when the HELP screen appears.
6) Assign to E$ a 64-letter string of your choice. For example, you might type:

E$="RAINBOWMAGAZINEISMOSTCERTAINLYMY FAVORITECOLORCOMPUTERPUBLICATION"

If you tried the example, you will have noticed that the blue marker has overwritten the letter M of MAGAZINE. The eighth letter of any 64-letter string E$ will be similarly overwritten.

270 . . . . . . .141
580 . . . . . . .175
850 . . . . . . .219
END . . . . . .197

**Listing 1:**

```
10 X=256*PEEK(27)+PEEK(28)-919
20 FORI=X TO X+305:READA$:A=VAL(
"&H"+A$):POKEI,A:B=B+A:NEXT
30 DATA 8E,4,61,BF,3B,7,8D,7B,C6
40 DATA FF,E7,C4,E7,A4,9F,88,1F
50 DATA 12,E6,A4,9E,88,BD,A1,B1
60 DATA 81,9,26,8,30,1,8D,10,26
70 DATA FA,20,E7,81,8,26,15,30
80 DATA 1F,8D,4,26,FA,20,DB,A6
```

```
90 DATA 84,81,CF,26,4,32,62,20
100 DATA D9,81,6B,39,81,A,26,9
110 DATA 30,88,20,8D,EA,26,F9,20
120 DATA C1,81,5E,26,9,30,88,E0
130 DATA 8D,DD,26,F9,20,B4,81,20
140 DATA 26,36,8E,4,98,E6,84,C1
150 DATA BF,27,4,8D,3B,20,11,9F
160 DATA 88,BD,A1,B1,81,41,25,F9
170 DATA 81,5A,22,F5,80,40,A7,84
180 DATA 1F,21,C6,6B,20,8C,8E,4
190 DATA F5,9F,88,CE,3D,D7,FF,3B
200 DATA 5,CE,3D,FF,FF,3B,3,39
210 DATA 81,26,26,20,7A,3D,FF,C6
220 DATA 6B,9E,88,E7,84,16,2,40
230 DATA 34,7F,4F,5F,1F,3,30,C8
240 DATA 4F,C6,7F,D7,8C,C6,5,BD
250 DATA A9,51,35,FF,81,41,26,5E
260 DATA 8D,C4,30,8C,4C,BD,B9,9C
270 DATA FE,3B,3,10,9F,88,BD,A1
280 DATA B1,8D,A,31,21,E6,A4,C1
290 DATA 6B,26,31,20,EE,81,D,27
300 DATA 67,C6,8,8E,4,91,A1,84
310 DATA 27,16,8B,C0,A1,84,27,10
320 DATA 80,C0,30,1,5A,26,EF,8D
330 DATA AF,AE,E4,30,1B,AF,E4,39
340 DATA 30,88,E0,C6,6D,E7,84,A7
350 DATA A4,36,20,39,C1,CF,26,C3
360 DATA 20,42,41,43,52,4F,53,53
370 DATA 0,44,4F,57,4E,0,81,44
380 DATA 26,E9,8E,4,F6,17,FF,61
```

```
390 DATA 30,8C,ED,BD,B9,9C,FE,3B
400 DATA 3,10,9F,88,BD,A1,B1,8D
410 IFB<>34802THENCLS:PRINT"  DA
TA ENTRY ERROR IN LINES 30     TH
ROUGH 400.":STOP
420 FORI=X+306TO X+610:READA$:A=
VAL("&H"+A$):POKEI,A:B=B+A:NEXT
430 DATA A4,31,A8,20,E6,A4,C1,6B
440 DATA 27,EF,C1,CF,26,F3,20,C
450 DATA E6,C4,2B,AB,32,62,86,6B
460 DATA A7,A4,20,40,9E,88,34,10
470 DATA 8D,27,35,10,34,10,30,88
480 DATA 20,A6,84,81,CF,27,4,8D
490 DATA 18,20,F3,35,10,34,10,30
500 DATA 88,E0,8D,D,20,F9,A6,84
510 DATA 81,6B,27,10,81,CF,39,30
520 DATA 1,8D,F3,26,FA,30,1F,8D
530 DATA ED,26,FA,39,9F,88,E7,A4
540 DATA 32,66,1F,12,8E,4,F5,CC
550 DATA CF,6,A7,80,5A,26,FB,5A
560 DATA 36,4,BE,3B,3,EC,41,10
570 DATA BF,3B,7,FF,3B,3,A3,1E
580 DATA 1F,12,CE,3B,A,4D,26,15
590 DATA 5D,26,14,34,10,AE,3E,E6
600 DATA 1F,C1,5F,25,2,E6,1,35
610 DATA 10,C1,5F,25,6,20,68,C1
620 DATA 12,22,64,AE,1E,E6,82,C1
630 DATA 5B,25,FA,30,1,E6,80,C1
640 DATA 5A,22,F,8D,49,20,F6,35
650 DATA 2,4A,27,6,C6,20,E7,C0
```

SOUTHERN SOFTWARE SYSTEMS

THE SPREADSHEET ZAPPER    NEW POWER FOR YOUR COCO

- **THE SPREADSHEET ZAPPER** bridges the gap between the great computational power of Radio Shack's Spectaculator and high quality graphical displays. A picture is worth more than 1000 numbers!
- Imagine being able to easily display all your carefully created Spectaculator data in the form of outstanding bar graphs, pie charts, and line graphs.
- The **SPREADSHEET ZAPPER** converts those nasty Spectaculator data files (ROM PAK or Disk) to data files that are 100% compatible with Southern Software Systems' graphical display programs—The **BAR ZAPPER, THE PIE ZAPPER,** and **THE GRAPH ZAPPER.**
- Now you can have the best of both - The complete flexibility of a spreadsheet program to do your computations and the use of high resolution graphing for display of your data.
- Compute your income and expenses; perform statistical computations; analyze the stock market; all using Spectaculator, then display the results using a bar graph, pie chart, or a line graph - *very impressive!!*
- Don't limit yourself to endless rows and columns of confusing numbers—forget special purpose plotting programs, get **total** flexibility.
- ***"Authors of commerically oriented programs should beg, borrow, or steal one of the instruction manuals to see* THE RIGHT WAY TO DO IT."** The Rainbow, Oct. 1983.

**Features of The DISPLAY ZAPPERS (The Bar Zapper, The Pie Zapper, The Graph Zapper)**

- **BAR ZAPPER** allows for 26 bars.
- **THE GRAPH ZAPPER** plots line graphs of data and equations.
- High resolution graphics with on screen numbers and labels, with or without grids.
- Save data for later graphing or editing.
- Hard copies with readily available screen print programs for nearly any brand of printer.
- 14 day money back guarantee
- **PIE ZAPPER** has up to 18 sectors.
- Thorough error prevention.
- User friendly, easy backup procedures.
- Detailed user's guide for all features.
- Low cost upgrade from tape to disk.
- Low res, building block graphs can't compare.
- Read the outstanding reviews in the Rainbow (Dec. 82, Apr 83, Oct. 83)

**The Display ZAPPERS—Bar, Pie, Graph**

**Spectaculator is a registered trademark of TANDY Corp.**

- 16-64K tape: **$15.95 + $1.00** shipping each—**$44.95 + $3.00** shipping for all 3
- 32-64K disk: **$19.95 + $1.00** shipping each—**$56.95 + $3.00** shipping for all 3

**The SPREADSHEET ZAPPER**

**Florida residents add 5% sales tax.**

- 32-64K tape: **$17.95 + $1.00** shipping—with all 3 tape Display Zappers: **$59.95 + $3.00** shipping
- 32-64K disk: **$25.95 + $1.00** shipping—with all 3 disk Display Zappers: **$79.95 + $3.00** shipping

***Send Check, Money Order or VISA / MasterCard number and expiration date.***
***All programs require Extended Basic and are compatible with 64K memory.***

MasterCard

SOUTHERN SOFTWARE SYSTEMS

VISA

485 South Tropical Trail, Suite 109 • Merritt Island, Florida 32952 • (305) 452-2217

```
660 DATA 20,6,C6,D,E7,C0,86,2,34
670 DATA 2,1F,21,E6,82,C1,FF,27
680 DATA 5B,30,1F,1F,12,4F,AE,84
690 DATA 30,88,20,E6,84,4C,C1,5B
700 DATA 25,F6,30,88,E0,E6,84,4C
710 DATA C1,5B,25,F6,81,3,27,D9
720 DATA 30,88,20,E6,84,C1,5A,22
730 DATA BD,8D,2,20,F3,C1,20,22
740 DATA 2,CB,40,E7,C0,39,AE,1E
750 DATA 30,88,E0,E6,84,C1,5B,25
760 DATA F7,30,88,20,E6,84,C1,5A
770 DATA 22,4,8D,E1,20,F3,C6,D
780 DATA E7,C0,86,2,34,2,1F,21
790 DATA E6,82,C1,FF,27,32,30,1F
800 DATA 1F,12,4F,AE,84,30,1,E6
810 IFB<>67098THENCLS:PRINT"  DA
TA ENTRY ERROR IN LINES 430   TH
ROUGH 800.":STOP
820 FORI=X+611 TOX+918:READA$:A=
VAL("&H"+A$):POKEI,A:B=B+A:NEXT
830 DATA 84,4C,C1,5B,25,F7,E6,82
840 DATA 4C,C1,5B,25,F9,81,3,27
850 DATA DD,30,1,E6,84,C1,5A,22
860 DATA 4,8D,AA,20,F4,35,2,4A
870 DATA 27,C4,C6,20,E7,C0,20,C4
880 DATA 5F,E7,C0,35,2,8E,3B,A
890 DATA 8D,18,C1,7,25,FA,CB,5
900 DATA C1,14,25,F4,8D,C,CB,A
910 DATA C1,30,25,F8,8D,4,CB,F
920 DATA 20,FA,A6,80,27,E,81,21
930 DATA 25,2,5C,39,4F,ED,C1,32
940 DATA 62,5F,20,D4,32,62,4F,ED
950 DATA C1,33,5F,8E,FF,FF,30,1
960 DATA EC,C3,26,FA,33,41,E3,C1
970 DATA 30,1F,26,FA,FE,3B,5,36
980 DATA 6,FF,3B,5,BD,B4,F4,5F
990 DATA 86,4,1F,1,CE,3B,D1,BD
1000 DATA A5,9A,7E,A5,9A,8E,3B,9
1010 DATA BD,B9,9C,7E,B4,F4,8E
1020 DATA 3B,D1,5F,86,4,1F,3,20
1030 DATA E7,CE,4,3F,5F,8E,4,71
1040 DATA A6,C5,81,AF,26,13,A6
1050 DATA 80,8C,4,78,27,7,81,6D
1060 DATA 26,F5,5A,20,F2,2B,8,16
1070 DATA FD,73,5C,C1,7,26,E2,8E
1080 DATA 4,71,CE,4,1,C6,7,86,6D
1090 DATA A1,80,27,15,5A,26,F9
1100 DATA 86,CF,A7,84,86,BF,A7
1110 DATA 88,20,FE,3B,3,BE,3B,7
1120 DATA 16,FC,C3,86,AF,A1,C0
1130 DATA 26,FC,A6,C4,81,CF,26,7
1140 DATA A7,88,1F,33,5F,20,B,A7
1150 DATA 88,1F,A7,5F,86,AF,A7
1160 DATA C4,86,CF,A7,1F,86,6D
1170 DATA 20,C7,C6,6B,CE,3D,FF
1180 DATA FF,3B,3,33,5E,A6,5F,E7
1190 DATA D4,81,FF,26,F6,C6,8,CE
1200 DATA 4,71,86,CF,A7,C0,5A,26
1210 DATA FB,86,BF,B7,4,98,20,AE
1220 DATA 0,0,0
1230 IFB<>103022THENCLS:PRINT"
DATA ENTRY ERROR IN LINES 830
THROUGH 1220.":STOP
```

| | |
|---|---|
| 90 | 21 |
| 240 | 243 |
| 330 | 82 |
| 420 | 211 |
| END | 101 |

Listing 2:

```
10 GOTO30
20 GOTO40
30 PCLEAR4:GOTO20
40 CLS:PRINT@225,"DO YOU WANT TO
 BE A SUPER ...":V=60:GOSUB390:C
LS:PRINT@234,"IF SO ...":FORI=0T
O1500:NEXT
50 CLEAR190,15104:S=256*PEEK(27)
+PEEK(28)-919:DEFUSR=S:DEFUSR1=S
+752:DEFUSR2=S+761:DEFUSR3=S+771
:DEFUSR5=S+879:S=15871
60 F$="EFAETOETAETIESAETOEORETSE
IAEODENLEGREHTEYSECIEFAEGOEMDELN
EPUEBOEHYETSECFEIAEGMEODENLEPBUR
HYTACURTISMNDLKJWVLDNMOGAFICSTYH
RUBPQKDNJMOWGAVLFICXSTYZHRUBP":C
LS:PRINT@37,"YOUR SCORE KEEPER N
EEDS":PRINT@67,"THE FOLLOWING IN
FORMATION:":PRINT
70 PRINT@132,"YOUR NAME? ";:A$="
"
80 GOSUB380:IFASC(X$)<>13THENA$=
A$+X$:PRINTX$;:IFLEN(A$)<14THEN8
0
90 A=RND(-TIMER):PRINT:PRINT:PRI
NT"DO YOU WISH TO LOAD A PREVIOU
SLYSAVED GAME?  (Y/N)"
100 GOSUB380:IFX$<>"Y"THEN160ELS
E IFPEEK(188)=6THEN130
110 GOSUB570
120 GOSUB380:IFX$="D"THEN520ELSE
IFX$<>"T"THEN120
130 CLS:MOTORON:PRINT@73,"POSITI
ON TAPE.":PRINT@101,"TYPE L & DE
PRESS play."
140 GOSUB380:IFX$<>"L"THEN140
150 CLS:PRINT"LOADING":OPEN"I",-
1,"B":INPUT#-1,A$,E$,Z:CLOSE#-1:
CLOADM:GOTO530
160 Z=0:GOSUB360:PRINT@344-LEN(S
TR$(Y)),Y;:PRINT@305+INT(7-.5*LE
N(A$)),A$;
170 A=USR(0)
180 IFPEEK(S)=254THEN230ELSEIFA=
0THEN450ELSEGOSUB370:C=USR1(0)
190 GOSUB380:IFASC(X$)=12THEN220
ELSEIFASC(X$)<>13THEN190
```

**THE ADVENTURE GENERATOR**
**has been approved for use to create entries in the Rainbow Magazine Adventure Contest.**

---

## WHERE'S-IT

by C.E. Laidlaw

What programs are on this disk? Which disk is my WIDGET program? WHERE'S-IT will answer these questions for you and maintain disk directory index files with up to 972 programs in each. Completely user-friendly, just run WHERE'S-IT and follow the prompts to:

Create index files holding up to 972 programs

Load or save existing index files

Add, delete or update index files for a specific disk

Sort index files alphabetically with a machine language sort

List index files to screen

Print index out with 162 programs to the page

Disk only......$19.95
(32K Extended Color BASIC)

---

**We are also a dealer for the following companies:**

Moreton Bay Software
Computerware
Spectrum Projects
Mark Data, Amdek, Epson
Pal Creations, Tom Mix
PBH Computer, Inc.
Spectral Associates,
Cognitec, Elite Software
Prickly Pear, Botek
Cobra Software
and many more fine companies

---

# JARB

SOFTWARE
HARDWARE

**1636 D Avenue, Suite C**
**National City, CA 92050**
**After hours:**
**BBS 619-474-8981**
**Orderline:**
**619-474-8982**

# T.A.G.

## THE ADVENTURE GENERATOR

ADVENTURE
©1984
JARB SOFTWARE

Cassette......$34.95
Disk/Amdisk......$39.95

### FEATURES

Creates stand-alone programs
Up to 100 rooms, 60 objects, 30 command words, and 9 conditional flags
Supports tape and disk output
Optional printer output of important sections during creation of ADVENTURE
Complete documentation
Includes sample ADVENTURE
Works with all models of the CoCo except MC-10
Requires 32K Extended Color BASIC

---

NEW

## GRAY LADY

by Terry A. Steen

Control your submarine in its efforts to destroy the enemy fleet. You must launch your sub to surface missiles while avoiding the depth charges. Five different types, hi-res graphics and spectacular sounds. Also a talking version included at no extra charge for those who have an SC01 based voice pack. Four screens and progressive difficulty make this all machine language program a real bargain.

Cassette: $19.95 Disk/Amdisk: $24.95

U.S. COD orders accepted, no charge cards please.
Shipping and handling $3.00
California residents please add 6% sales tax

see us at RAINBOWfest CHICAGO

# RAINBOWfest

# CHICAGO

The fun and excitement of **RAINBOWfest** is coming your way . . . and now there will be a **RAINBOWfest** near you!

For the 1983-84 season, we scheduled four **RAINBOWfests** in four parts of the country. If you missed the **RAINBOWfests** in Fort Worth on Oct. 14-16, Long Beach on Feb. 17-19, and at New Brunswick on March 30-April 1, you still have time to make plans *now* to attend our Chicago show. It will offer fun, excitement, new products, seminars and information for your CoCo!

Our Chicago show will be held at the Hyatt Regency, Woodfield, which offers special rates for **RAINBOWfest**. The show will open at 7 p.m.-10 p.m. Friday, run 10 a.m.-6 p.m. Saturday and close with an 11 a.m.-4 p.m. session Sunday. It will have a CoCo Community Breakfast featuring an outstanding national speaker from the Color Computer World. And the exhibition will be interspaced with a number of seminar sessions on all aspects of CoCo — from writing in machine language to making your BASIC work better.

But most of all, there will be exhibitors. Lots of them. All ready to demonstrate products of every kind. Some with special programs and hardware items to introduce. Others with show specials.

Tickets can be secured directly from *the Rainbow*. We'll also send you a special reservation form so you can get your special room rate.

Come to **RAINBOWfest** . . . help us all celebrate CoCo Community at its finest.

***Chicago — June 22-24***

Come to **RAINBOWfest** — the site of CoCo's very first show. And right next to the world's largest indoor shopping mall.

**RAINBOWfest-**Chicago
**DATES:** June 22-24
**HOTEL:** Hyatt Regency Woodfield
**Rooms:** $46 per night single/double
**KEYNOTE:** Ed Juge, director of market planning for the Tandy Corporation
**Advance Ticket Deadline:**
June 18, 1984

**Discount Air Fares**

**UNITED**

United Airlines and *the Rainbow* have joined together to offer a special discounted fare to attendees of **RAINBOWfest**, Chicago. Simply by calling United at the toll free number listed below and identifying our meeting, with account number 2426, you will be eligible for a special "super saver" fare. This could mean as much as a 50 percent discount off that regular coach fare.

(800) 521-4041
Account Number 2426

---

**RAINBOWfest**

**FREE RAINBOW poster for first 500 tickets ordered.**
**FREE T-shirt to first 5 people from each state who buy tickets.**

**Make checks payable to:**
***the Rainbow***

**MAIL TO:**
***RAINBOWfest***
**P.O. BOX 209**
**Prospect, KY 40059**

**YES,** I'm coming to *RAINBOWfest* in Chicago.
Please send me:

_________ three day tickets at $8 each total _________

_________ one day tickets at $6 each total _________

(Specify day) _________

_________ breakfast tickets at $11 each total _________

TOTAL ENCLOSED (U.S. FUNDS ONLY, PLEASE) $ _________ **Handling Charge $1**

PRICES SLIGHTLY HIGHER AT THE DOOR

—Also send me a hotel reservation card for Chicago

NAME *(please print)* _________
STREET & NUMBER _________
CITY & STATE _________
TELEPHONE _________ ZIP CODE _________
COMPANY _________

Orders received less than two weeks prior to show opening will be held for you at the door.

VISA, MasterCharge, American Express accepted.

My Account # _________ Ex. Date: _________
Signature _________

# RAINBOWfest Chicago

## Seminar Program And Speakers

### Ed Juge — Keynote Speaker

Ed, director of market planning for the Tandy Corporation, will be our keynote speaker at RAINBOWfest's "CoCo Community Breakfast."

### Frank Hogg — Advanced Operating Systems

Frank is the president of Frank Hogg Laboratory and a forerunner in FLEX and OS-9 systems.

### Richard Parry — Music Synthesis

Richard is the founder and owner of Speech Systems and is the designer of music and speech synthesizers.

### Linda Nielsen — Women And Computers: How And Why

Linda, of Moreton Bay Laboratory, and several others active in the CoCo area, will lead a discussion on women's involvement in computing in general and the Color Computer in particular.

### Jim Reed — Writing For RAINBOW

Jim, managing editor of THE RAINBOW, will talk about how you can submit programs and articles to magazines for fun and profit. He is also senior editor of PCM — The Magazine For Professional Computing Management.

### Michael Plog and Charles Santee — Improving Educational Software

Michael Plog is an education writer for THE RAINBOW and an educational researcher in addition to being a major partner in the Center for Opinion Research.

Dr. Santee is an education writer for *Hot CoCo* and has published poetry and curricular as well as statistical and educational software (including *CCM#3* for JARB Software). He is a recipient of several grants and awards for educational technology.

### Dale Puckett — Beginners Tour Of OS-9 / Beginners Tour of BASIC09

A free-lance writer and programmer, Dale has worked with microprocessors since 1976 and has just completed his first book, "The Official BASIC09 Tour Guide." Dale will be available to sign copies of his book at RAINBOWfest.

### Dan Downard — Machine Language For The Beginner

Dan Downard is the technical editor for THE RAINBOW and an electrical engineer. He has been involved in electronics for 24 years through ham radio (K4KWT). His interest in computers began about five years ago and he has built several 68XX systems.

### Ken Kaplan — Secrets Of OS-9

Ken is president of Microware, the developers of the OS-9 Operating System.

### CoCo Classroom

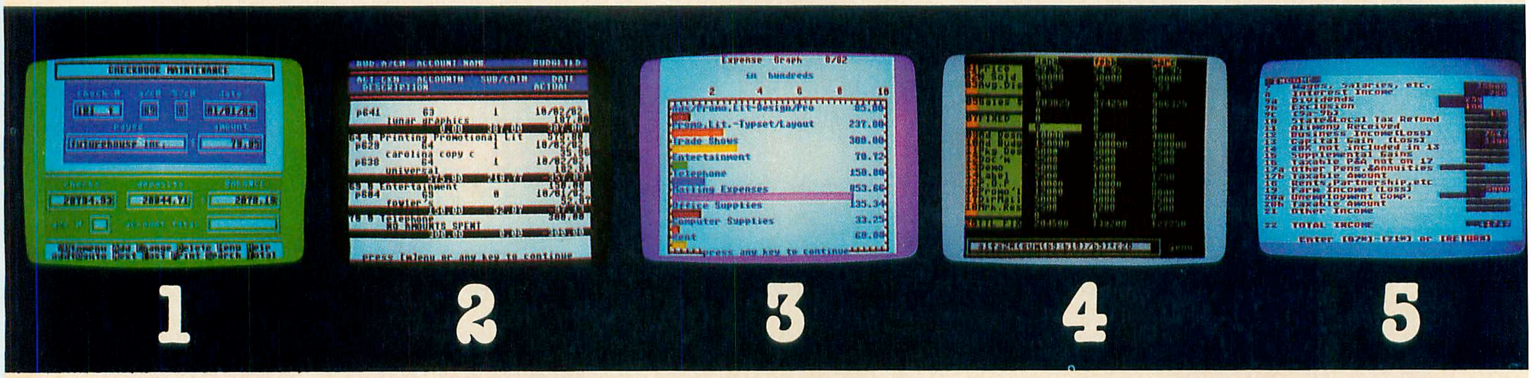
Sharpen your programming skills and learn about LOGO. Introduce your computer illiterate friends to the wonderful world of CoCo. Classes will be conducted by trained Radio Shack instructors.

**PLUS . . . Additional seminars are planned as well.**

Admission to all seminars is at no charge. See registration form for admission prices to exhibit area and breakfast.

# Five Easy Ways To Clean Up Your Finances.

**FREE** running demo on Commodore 64 version!



actual screen display   *indicates function being shown

Chart of Accounts
*Checkbook Maintenance
Check Search
Prints Checks

*Detail Budget Analysis
Summary Budget Analysis
Income/Expense Statements
Net Worth Statement

Appointments Calendar
Payments Calendar
*Color Chart Package
Mailing List

*Spreadsheet
Compatible with Finance 1, 2 and 5

*Income Tax
Prints forms
Most schedules
Uses Finance 1, 2 and 4

Complete Personal Accountant
futurehouse

# the Complete Personal Accountant™

Whether you're cleaning up at home or around the office, there's NOW a COMPLETE line of money management software that will attend to all the details, while letting you see the whole financial picture. The *Complete Personal Accountant's* exclusive combination of easy to use programs give the wise investor a quick and dependable way to control finances and plan for the future.

FINANCE 1 gets you organized with a standard chart of accounts adaptable to any situation. The Checkbook Maintenance program with *full screen editing* and special 'Help' commands let you find any check by any field. You can flag tax deductibles, reconcile your bank statement, print checks and more.

FINANCE 2 tells you where your money is, where it's going and where it's coming from. The Detail and Summary Budget programs show exactly where you're spending your money. The Income/Expense and Net Worth programs provide professional-looking statements that can be printed with any 80 column printer.

FINANCE 3 separates the CPA from the competition. No other finance package for the home or small business gives you Appointments and Payments Calendars for scheduling your time and money. Few packages offer the ability to chart each account in color. And only the CPA includes a mailing list with 1200 name capacity*. All reports are printable with most 80 column printers.

FINANCE 4 lets you determine the "what if's" of your financial future. With this easy to learn spreadsheet you'll spend more time making decisions and less time crunching numbers.

FINANCE 5, The Tax Handler™, uses your files from Finance 1, 2 and 4 to complete your taxes in a fraction of the normal time.

The Complete Personal Accountant™ line of money management software is simply the most comprehensive, easy to use financial software available anywhere.

| | Com 64 | Atari* | Color* | VIC 20 | Price |
|---|---|---|---|---|---|
| Finance 1 | • | • | • | • | 39.95 |
| Finance 2 | • | • | • | • | 29.95 |
| Finance 3 | • | • | • | • | 29.95 |
| Finance 4 | • | • | • | | 29.95 |
| Finance 5 | • | • | • | | 59.95 |
| Complete Set (1-3) | • | • | • | • | 79.95 |
| Complete Set (1-5) | • | • | • | | 149.95 |

*Atari version disk only   *Finance 5 on TRS-80 color requires 32K

Prices subject to change without notice. Add $3.00 for postage and handling. Ask your local dealer to see a running demo or call 1-800-334-SOFT to order direct.

futurehouse™

P.O. Box 3470 Department C,
Chapel Hill, North Carolina 27514

Atari, Commodore 64/Vic20, TRS 80 Color are trademarks of Atari, Inc.; Commodore Electronics, Ltd.; and Tandy Corp. respectively.

```
200 C=USR2(0):Z=A+Z
210 PRINT@344-LEN(STR$(Z)),Z;:A=
USR3(0):GOTO180
220 C=USR2(0):A=USR5(0):GOTO180
230 CLS:PRINT@80-LEN(A$)/2,A$;:P
RINT@104,"YOUR SCORE IS ";Z;".":
PRINT"     YOU";:IFZ<200THENV=20:
PRINT" EARNED A ..."ELSEIFZ<300T
HENV=35:PRINT"'RE ALMOST A ..."E
LSEIFZ<400THENV=50:PRINT"'RE A .
.."ELSEIFZ<500THENV=60:PRINT"'RE
 A SUPER ..."
240 IFZ>499THENV=70:PRINT"'RE TH
E GREATEST ..."
250 GOSUB390
260 PRINT@101,"YOU HAVE 5 OPTION
S:":PRINT" 1) REPLAY GAME JUST F
INISHED.":PRINT" 2) PLAY ANOTHER
 GAME.":PRINT" 3) TERMINATE PLAY
.":PRINT" 4) SAVE GAME ON TAPE O
R DISK."
270 PRINT" 5) VIEW FINISHED GAME
.";:PRINT@356,"TO TAKE AN OPTION
, TYPE           THE ASSOCIATED N
UMBER."
280 GOSUB380:X=VAL(X$):IFX=1THEN
CLS5:Z=0:PRINT@0,E$;:POKE1031,17
5:PRINT@145,LEFT$(E$,7)+CHR$(191
);:PRINT@305+INT(7-.5*LEN(A$)),A
$;:PRINT@344-LEN(STR$(Z)),Z;:FOR
I=97TO449STEP32:PRINT@I,STRING$(
15,43);:NEXT:GOTO170
290 IFX=2THENZ=0:GOTO160ELSEIFX=
3THENGOTO510ELSEIFX=5THEN490ELSE
IFX<>4THEN280
300 IFPEEK(188)<>6THEN540
310 CLS:PRINT"TYPE M.  POSITION
TAPE.  THEN   TYPE R & DEPESS re
cord BUTTONS. TYPE S."
320 GOSUB380:IFX$<>"M"THEN320
330 MOTORON:GOSUB380:IFX$<>"R"TH
EN330
340 MOTOROFF:GOSUB380:IFX$<>"S"T
HEN340
350 CLS:PRINT"SAVING":OPEN"O",-1
,"B":PRINT#-1,A$,E$,Z:CLOSE#-1:F
ORI=0TO10:NEXT:CSAVEM"C",&H3B00,
&H3DFF,0:GOTO510
360 E$="":CLS5:FORI=1TO32:E$=E$+
MID$(F$,151-RND(75),1):E$=E$+MID
$(F$,76-RND(75),1):NEXT:PRINT@0,
E$;:POKE1031,175:PRINT@145,LEFT$
(E$,7)+CHR$(191);:FORI=97TO449ST
EP32:PRINT@I,STRING$(15,43);:NEX
T:RETURN
370 CLS:PRINT@5,"THE FOLLOWING I
S THE SET OFWORDS THAT YOU FORME
D THIS TURN.IF ALL ARE NOT VALID
  DICTIONARYWORDS, PRESS clear.
  OTHERWISE,PRESS enter TO CONTI
NUE PLAY.":PRINTSTRING$(32,207):
RETURN
380 X$=INKEY$:IFX$=""THEN380ELSE
RETURN
390 GOSUB480:PMODE4:PCLS1:SCREEN
1,1:G=5:M(0)=125:N(0)=100
400 P=.0174532925:H=G*SIN(P*72):
J=COS(P*36):K=SIN(P*36):L=G*COS(
P*72):M(1)=M(0)+G:N(1)=N(0):M(2)
=M(1)+L:N(2)=N(0)-H:M(3)=M(2)+L:
N(3)=N(0):M(4)=M(3)+G:N(4)=N(0):
M(5)=M(4)-H*J:N(5)=N(4)+H*K:M(6)
=M(5)+L:N(6)=N(5)+H
410 M(7)=M(6)-G*J:N(7)=N(6)-G*K:
M(8)=M(7)-H*J:N(8)=N(6):M(9)=M(8
)+G-H*J:N(9)=N(5):G=G+5:GOSUB430
:M(0)=M(0)-7:N(0)=N(0)-2:IFG<>V
THEN400
420 FORT=1TOV STEP6:GOSUB440:NEX
T:CLS:RETURN
430 FORI=0TO8:LINE(M(I),N(I))-(M
(I+1),N(I+1)),PRESET:NEXT:LINE-(
M(0),N(0)),PRESET:RETURN
440 PMODE3:SCREEN1,0:FORI=1TO150
:NEXT:SCREEN1,1:FORI=1TO150:NEXT
:RETURN
450 CLS:PRINT@41,"ORDER OF PLAY"
:PRINT@98,"1. USE ARROWS TO POSI
TION.":PRINT"  2. TO PUT OPTIONA
L LETTER IN   RED CHOICE POSITIO
N, PRESS      SPACE AND THEN LET
TER KEY.":PRINT"  3. TYPE 'A' FO
R across OR 'D'  FOR down."
460 PRINT"  4. TYPE EACH LETTER
NEEDED      FOR WORD.":PRINT"  5.
 PRESS ENTER.":PRINT"  6. TO END
 GAME TYPE '&'.":PRINT@450,"TO R
ESUME PLAY, PRESS ENTER."
470 GOSUB380:IFASC(X$)<>13THEN47
0ELSEIFZ=0THEN160ELSE200
480 FORI=0TO1500:NEXT:T$="T5L8D0
2BB-BGF+GL4DP8":U$=T$+"T5L8D02BB
-BGF+GL4EP8":PLAYU$:RETURN
490 C=USR2(0):PRINT@484,"TO RESU
ME PRESS ANY KEY.";
500 GOSUB380:IFX$=""THEN500ELSEC
LS:GOTO260
510 CLEAR100,256*PEEK(116)+255:E
ND
520 CLS:OPEN"I",#1,"B":INPUT#1,A
$,E$,Z:CLOSE#1:LOADM"C"
530 POKES,255:C=USR2(0):GOTO210
540 CLS:GOSUB570
550 GOSUB380:IFX$="T"THEN310ELSE
IFX$<>"D"THEN550
560 CLS:OPEN"O",#1,"B":WRITE#1,A
$,E$,Z:CLOSE#1:SAVEM"C",&H3B00,&
H3DFF,0:GOTO510
570 PRINT@294,"TAPE OR DISK?  (T
/D)":RETURN
```

see us at RAINBOWfest
CHICAGO

# THE DATAMAN

## MINER BY LARRY LANDWEHR

Like his father before him, Sid is a coal miner. Working hundreds of feet below ground it is Sid's job to blast the rock so that the coal seam is exposed. See if you can direct Sid to the most productive areas. How many lumps of coal can you collect before you run out of dynamite? Young and old alike will enjoy this hi-res all machine language game from the author of "IN ASSEMBLY LANGUAGE".

CAT# DM018 16k $14.95 (CAN) $12.95 (US)

* * * * * * * * * * * * * * * *

## EXECCART BY PETER KARWOWSKI

EXECCART is a M/L program that allows you to copy ROMPAC programs to tape. They can then be loaded back into a 64K CoCo and examined or modified. You can run most of your ROMPAC's from disk without ever having to remove the disk controller. This saves tremendous wear and tear on the contacts. EXECCART may also be used to add a loader to your own programs to turn on 64K and to copy your BASIC ROMs into RAM so that you can make modifications.

CAT# DM009 64K $17.95 (CAN) $14.95 (US)

* * * * * * * * * * * * * * * *

## THE SPOOLER BY PETER KARWOWSKI

Whenever you use your printer, your computer is totally dedicated to feeding it. This isn't such a problem when you just want to print out a couple of lines, but LLISTing a long program can be very boring. If you have better things to do than sit around waiting for the printer, then "THE SPOOLER" is just what you need. THE SPOOLER will work on ANY TRS-80 Color Computer from a 16K right up to 64K with disks. Extended BASIC is NOT required.

CAT# DM010 16K $12.95 (CAN) $10.95 (US)

## NEWERROR BY PETER KARWOWSKI

NEWERROR will provide four extra functions and abilities for your Color Computer.
1. Give you an audible error warning.
2. Provide full english error messages.
3. Add the ON ERROR GOTO command to BASIC
4. Allow simulated errors for debugging.

As an added bonus we include a second M/L program that you can add to your own BASIC programs to provide them with the ON ERROR GOTO feature. You may use this program even in programs you sell.

CAT# DM008 16K $19.95 (CAN) $16.95 (US)

## SCREEN BY JOHN MIRAK

Four much needed features are added to Basic with this new machine language utility program from Australia.

1. Automatic line numbering
2. Line by line program listing
3. Motor on/off from the keyboard.
4. Your choice of light or dark, orange, green or black screen with light or dark orange or green characters.

Works with Basic, Ext Basic & Disk Basic

CAT# DM015 16K $12.95 (CAN) $10.95 (US)

ADD 3% SHIPPING & HANDLING
PER ORDER-MINIMUM $2.50

420 FERGUSON AVE. N.
HAMILTON, ONTARIO
CANADA L8L 4Y9
PHONE 416-529-1319

**DEALER
INQUIRES
WELCOME**

## SWISS ARMY KNIFE BY RALPH BLOCH

One of our most prolific authors (PRETTY PRINTER-P.U.F.F.-LIBRARY) has come up with another winner. As the namesake of this program has many blades so SAK has many functions. The disk owner will find it indispensable for diagnosing and fixing the many gremlins that attack a disk system. It will work on any number of tracks and can even read FLEX disks. By copying one sector at a time you can often save an otherwise uncopyable disk.

RAINBOW CERTIFICATION SEAL

CAT# DM553 32K $29.95 (CAN) $25.50 (US)

## SUPER EDIT BY LARRY LANDWEHR

RAINBOW CERTIFICATION SEAL

This powerful new utility program from the author of "IN ASSEMBLY LANGUAGE" adds many new editing commands to Basic. You can PRINT one screenful at a time, DELETE a line or lines, JOIN several lines together and hide your programs, or FIND strings and variables. Also included are commands to INSERT, COPY, MOVE & REPLACE one line or a block of lines. Super edit works with Extended Basic but Extended Basic is not required.

CAT# DM016 16k $19.95 (CAN) $16.95 (US)

**SEND $3 FOR OUR NEW
80+ PAGE CATALOGUE**

## BONES BY MARK MORAN

This original dice game is fun for the whole family. Play by yourself, against the computer or with your friends. Although simple enough for the youngest player the adults will find it addictive.

CAT# DM011 16K $12.95 (CAN) $10.95 (US)

Now you can ´Roll Them Bones´ on the MC10. We have transferred this popular game without losing any of it´s features.

CAT# DM101 4K $12.95 (CAN) $10.95 (US)

* * * * * * * * * * * * * * * * * * * *

## MUSIC EDITOR BY PATRICIA SHELTON

This program will take regular sheet music and convert it to "play by number" music. You enter the words, notes and chords from the keyboard and the program will output, to the screen or printer, an easy to read version for C or G type organs. Your files can be edited and saved to disk or tape. Easily produce a songbook of your own favorite tunes.

CAT# DM012 16K $12.95 (CAN) $10.95 (US)

* * * * * * * * * * * * * * * * * * * *

## HOME INVENTORY BY JEFF PYNE

Home Inventory was written for the average home owner to simplify the tedious task of weeding through his posessions. This small database will save an organised list of brand names, serial numbers, values, dates of purchase etc. This could prove to be your most valuable program if you ever have to deal with an insurance company so be sure you have a copy of the programs output in a save place in case of fire or theft. Ext Basic required-Printer optional

CAT# DM013 16K $12.95 (CAN) $10.95 (US)

# PIPELINE

**TOM-TOM SIGNALS . . .** In a joint statement, Tom Mix of Tom Mix Software and Tom Nelson of Softlaw Inc., have announced that Tom Mix Software is to be the "alternate source" for the Softlaw VIP series of programs for the Color Computer.

Tom Mix Software will sell and service the VIP series, which includes *VIP Writer*, *VIP Speller*, *VIP Calc*, *VIP Database*, *VIP Terminal* and *VIP Disk-Zap*.

The purpose of the arrangement is to "reinforce the dealer network that now carries the VIP series, and to open up new markets for the software."

We're told that the same dealer discount structure which exists for Tom Mix Software will apply for the VIP series as well.

You can reach Tom Mix by phone at (616) 957-0444; or write to Tom Mix Software, 4285 Bradford NE, Grand Rapids, MI 49506.

* * *

**GOT DISK PROBLEMS?** The Bit Scrubber™ could be the solution. Many of the problems related to the storage and retrieval of data to and from diskette are caused by residual magnetic noise and clutter. The people at Techstar, Inc., developers of the Bit Scrubber, claim to have solved those problems.

Editing a program generates magnetic clutter on a disk. Power fluctuations produce a magnetic field around the drive head that spawns more noise on the disk. And the erasing process is not perfect: each and every time the head erases previously stored data and replaces it with new data, residual magnetic noise remains on the disk. After many write/erase operations, this noise level justifies thorough disk erasure. Enter — the Bit Scrubber.

The Bit Scrubber erases all commercially available floppy disks: eight inch, 5¼ inch, and the new mini diskettes. It has no moving parts and it does not require electrical power. Instead, it utilizes a high-energy magnetic circuit with monolithic flux density (whatever that means) that uniformly orients the magnetic particles on the disk.

Anyway, it sounds good. For more information about the Bit Scrubber — or to order a unit — write to Techstar, Inc., 8651 N.W. 5th St., Miami, FL 33166, or call (305) 592-0201. The cost is $49.95, plus $4 for shipping and handling.

* * *

**THIRD GENERATION SOFTWARE?** Autumn Color Software has announced the introduction of a new disk-based genealogy program for the Color Computer. The program, *Ancestors*, uses direct access disk files to create, modify and display up to 500 genealogical records. The index displays or prints names and assigned reference numbers. Each complete record can be displayed on-screen or printed as a typical family group sheet. A three-generation pedigree chart can be displayed on the monitor and paged forward or backward from any designated starting point.

Each record will hold 22 fields of data including record and reference numbers, name, number of children, dates and places of birth, marriage, death and burial as well as occupation, military, religion and residence information. Also, data on other spouses and reference to parents are included in each record.

*Ancestors* is available on disk for $39.95 and includes a fully-documented manual. It requires 32K and one disk drive. Order from Autumn Color Software, 4132 Lay St., Des Moines, IA 50317. Iowa residents add four percent sales tax.

* * *

**COCO CALLING.** The third printing of the *National Computer Bulletin Board Directory* is now available to all computer users who enjoy accessing BBS systems. This directory contains over 1400 computer bulletin board telephone numbers which are organized in numeric sequence by area code and state. The *Directory* also contains a key field which identifies relevant information such as the BBS type, its Baud rate, operating hours, and special comments specific to each system.

Many of the bulletin boards contain programs which can be downloaded at no charge, message services, etc., and for the reasonable price of $2 postpaid, you can get it from Thomas Wnorowski, 3352 Chelsea Circle, Ann Arbor, MI 48104.

**SHOPPING WITH COCO.** *Kolourdex For Koupons* is a new file-management system designed to help shoppers make more effective use of their cash-off coupons. The system stores information such as product name, product type, expiration date, and coupon amount for 720 coupons in the disk version and 400 in the cassette version. The coupons may be retrieved by product name, type, expiration date or amount, and it can list the highest-valued coupons in your file for the best possible savings.

*Kolourdex For Koupons* is available for Color Computers with Extended BASIC and at least 32K of RAM. The disk version is $28.95 and the cassette version is $24.95, plus $1.50 P&H on each. To order, write to Kensoft, 2102 50th St., Kenosha, WI 53140, or call (414) 654-2722.

* * *

**THE INTERFACE COUNSEL.** Metric Industries has announced production of the Model 101 Serial to Parallel Interface, designed to convert the RS-232-C serial port of the Color Computer to a Centronics-type parallel output. This allows the CoCo to be used with Gemini, Epson, and many other printers, and it permits the Radio Shack DMP-100 to run three to four times faster than possible with the standard 600 Baud serial input. The interface has six switch-selectable Baud rates, from 300 to 9,600, and is covered by a 90-day warranty for parts and labor.

Included with the 101 is a 9-volt power supply which, depending on the type of printer you use, may or may not be needed. If you're interested, write to Metric Industries, P.O. Box 42396, Cincinnati, OH 45242, or call (513) 677-0796. The cost of the unit is $54.95, plus 5½ percent tax for Ohio residents.

* * *

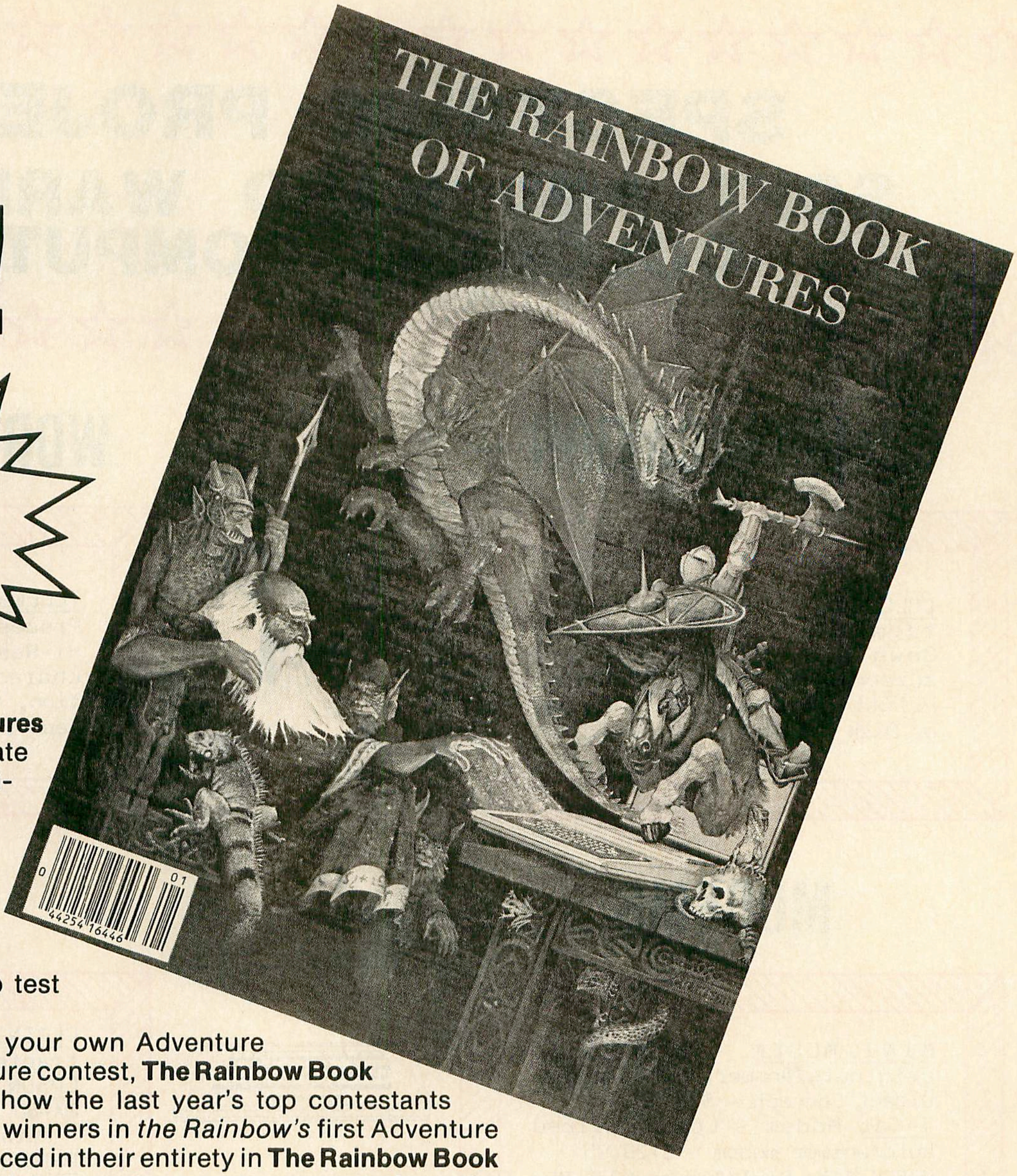
**ANOTHER SMARTY!** A new intelligent terminal program has been introduced for the CoCo by Rabbitt Ware Inc. *COCOCOM* features offline message preparation and editing, upload and download capabilities, and automatic storage of all communications. Captured data can be renamed and archived on disk or sent to a 300, 600, or 1,200 Baud printer.

*COCOCOM* requires 16K Extended BASIC and one disk drive and is available for $12 on tape and $15 on disk from Rabbitt Ware Inc., Rt. 1 Bascomb Rd., Jackson, TN 38305. Write or call (901) 668-8816.

* * *

# It's here!

see us at
RAINBOWfest
CHICAGO



**The Rainbow Book of Adventures** is in stock and ready for immediate delivery. This 112-page special edition contains top contest winners and a dozen more selected Adventures, ready for you to type in and run.

If you're just getting started in Adventures, here's a collection of 14 Adventure games ready to test your wits.

If you're considering entering your own Adventure creation in *the Rainbow's* Adventure contest, **The Rainbow Book of Adventures** is a must to see how the last year's top contestants became winners. All of the award winners in *the Rainbow's* first Adventure contest have their entries reproduced in their entirety in **The Rainbow Book of Adventures** — plus there are hints to authors and comments from the chief judge of last year's contest to help you hit the ground running in this year's Adventure writing competition.

**The Rainbow Book of Adventures** is just $7.95.

**The RAINBOW Tape of Adventures** is just $7.95

★★★★

Please send ________________ copies of **The Rainbow Book of Adventures** @ $7.95 each.

Please send ________________ copies of **The Rainbow Book of Adventures Tape** @ $7.95 each.

Name (please print) ____________________________________

Street Address ____________________________________

City & State ______________________________ ZIP ____________

WEST DIVISION

**Spectrum Projects**
4285 Payne Ave/#9866
San Jose, CA 95117

**CALL 212-441-2807**
Add $3.00 S/H
NY Res Add Tax

EAST DIVISION

**Spectrum Projects**
PO Box 21272
Woodhaven, NY 11421

★★★★★★★★★★

# SPECTRUM PROJECTS
## SOFT AND HARD WARES FOR COLORFUL COMPUTING

## COMMUNICATION

COLORCOM/E - A complete smart terminal package! Upload, Download, Hi-Res (51X24) screen, 300/1200 Baud, Offline Printing and much more. Rompak or Disk - $49.95

## WORD PROCESSING

TELEWRITER-64 - Top CoCo Word Processor for 2 years! Three Hi-Res screens, true lowercase characters, right justification, full screen editor.
Tape $49.95 Disk $59.95

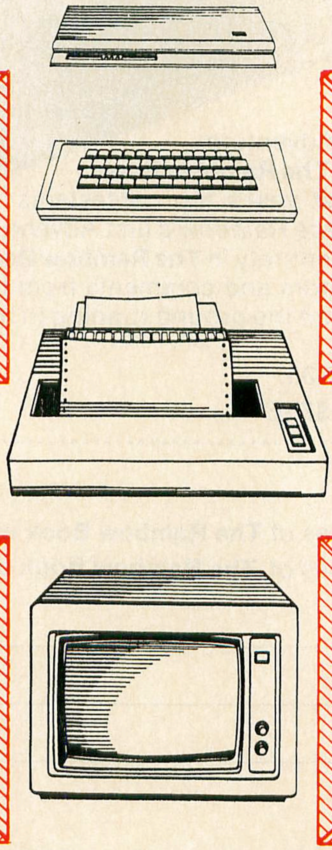
#1

## MODEMS

MINI-MODEM - 300 Baud, Originate/Answer, Full Duplex, Direct Connect - $79.95
J-Cat Modem - Lowest priced auto/answer modem - $129.95
HAYES Auto Dial/Answer $239.95
Prices include Modem cable.

## PRINTERS

GEMINI 10X* - 120 cps, 9X9 dot tractor/friction feed $299.95
EPSON RX-80* - Faster than the MX-80 plus Graftrax! - $349.95
* Parallel interface required.
PBH Parallel Interface - Save $40 if ordered with above printers ! - $49.95



## KEYBOARDS

PREMIUM (Micronix) $69.95*
SUPER-PRO (Mark Data) $69.95
HJL57 Keyboard - $79.95*
* - Includes free software for 4 function keys. Specify Model /Revision Board. PREMIUM board fits CoCo II w/adaptor. Add $5

## MONITORS

MONOCHROME Monitors - 80X24 screens plus Hi-Res:
Green- $99.95 Amber- $119.95
AMDEK Color Monitor - $299.95
VIDEO PLUS - video interface for above monitors - $24.95
V/P CoCo II Version - $29.95
CoCo II(Color) Version - $39.95

Buy any Modem and
Save $10 off Colorcom/E

Order Line
212-441-2807

Buy any Printer,
Keyboard or Monitor and
Save $10 off Telewriter-64

# SPECTRUM PROJECTS
## SOFT AND HARD WARES FOR COLORFUL COMPUTING

## SPREADSHEET

ELITE CALC - 255 Rows, 255 Columns, Help Displays, Repeat Text Entries, Insert, Delete, Move Entire Rows, Selectable Auto Cursor Movement, Formulas 255 chars. Disk/Tape $59.95

## DATA BASE MANAGER

PRO-COLOR FILE - 60 Data Fields, 8 Report Formats, 1020 bytes/record, Sorts 3 Fields, Screen and Summary Reports, Duplicate Records and Fields, Page Titles - Disk $79.95

**Buy 'em both for $99.95**

**Save $40 !**

## DISK DRIVES

DRIVE 0 System - 40 trks, Gold Platted Connectors - $349.95
AMDEK System - 624K Bytes with 3" Disk Cartridge - $599.00
DISK CONTROLLER - $139.95
(Systems include controller)

## GAME CONTROLLERS

WICO Command Adaptor - Hookup 2 Atari type joysticks- $19.95
With 2 Atari joysticks- $39.95
WICO Analog Joystick - Self Centering and Free Floating !! Red arcade size handle- $39.95

## UTILITIES (DISK)

| | |
|---|---|
| 1. FHL O-PAK | $34.95 |
| 2. Disk Doctor | $39.95 |
| 3. Super Forth | $39.95 |
| 4. Super Screen Machine | $49.95 |
| 5. OS-9 | $69.95 |
| 6. FHL Flex | $69.95 |
| 7. MicroWorks EDTASM | $99.95 |

| Buy | Save |
|---|---|
| 2 | 10% |
| 3 | 15% |
| 4 | 20% |

## GAMES (TAPE)

| | |
|---|---|
| 1. Cubix | $24.95 |
| 2. Calixto Island | $24.95 |
| 3. The King | $26.95 |
| 4. Guardian | $27.95 |
| 5. Junior's Revenge | $28.95 |
| 6. Colorpede | $29.95 |
| 7. Zaxxon | $39.95 |

WEST DIVISION
**Spectrum Projects**
4285 Payne Ave/#9866
San Jose, CA 95117

Add $3.00 S/H
NY Res Add Tax

EAST DIVISION
**Spectrum Projects**
PO Box 21272
Woodhaven, NY 11421

# THE FUN CONNECTION

By Michael Popovich

*Connect 4* is a fun game in which you must connect four of your pieces in a row, either vertically, horizontally, or diagonally.

The board is a 7 x 6-inch grid in high resolution graphics. When you *RUN* the game the board is set up and a circular chip appears in the upper-left corner of the grid. The left and right arrow keys move the chip, and the down arrow "drops" the chip into the grid.

In line 10 the game has been *POKEd* to speed up the microprocessor. The program has a little work to do in finding four chips connected in a row, so this allows the program to do it much faster. Before the program is *SAVEd* on tape you must either hit the Reset button or *rePOKE* the value to slow the machine back down.

When the game is in play, you can hit the 'E' to end the game. This will *rePOKE* the value to slow the microprocessor down. You can also use this option when the game is over. When the game is in play, a SHIFT '1' will reset it for a new game. When the game is ended, an 'R' will reset it.

The biggest challenge I faced in this game was detecting four in a row. As a matter of fact, the routine that accomplishes this is half of the entire program.

*(Michael Popovich is a sophomore in college. He works part-time as a waiter and enjoys his CoCo as his greatest hobby.)*

# THE SPECTRUM VOICE PAK

**$49.95 SPECIAL**

Price good with purchase of any Talking Software below ! Offer expires May 25, 1984

**$69.95 CoCo I**

New Features ! Single key echo and phoneme printouts ! Works w/$29.95 Disk"Y" cable!

**$79.95 CoCo II**

Includes adapter to work on 16K-64K CoCo II's. Same features as CoCo I. In stock!

# TALKING SOFTWARE

**Talking Final Countdown** - You must stop the mad general from launching a missle at the Russians and causing WW III ! Has multiple voices for added realism. 32K EXT **$24.95**

**Educational Software** - Computer Island's educational programs turn your CoCo into a true teaching machine. Reinforce basic lessions with the aid of voice. Three/pak special includes Math Drill, Spelling Tester and Foreign Languages. 16K EXT **$24.95**

**Talking Score E-Z** - An excellent adaptation of a Yahtzee type program with added speech. Up to 6 players can compete at a time, and all scoring and record keeping is done by the computer. 32K EXT **$24.95**

**Term Talk** - A speaking smart terminal program for your CoCo. It contains all the features of an intelligent communications package, plus it talks! (Shades of War Games) 16K EXT Tape **$39.95** Disk **$49.95**

**All orders plus $3.00 S/H - NY Residents add sales tax**

SPECTRUM PROJECTS

**WEST DIVISION :**
**4285 PAYNE AVE/#9866**
**SAN JOSE, CA 95117**

**EAST DIVISION :**
**PO BOX 21272**
**WOODHAVEN, NY 11421**

(212) 441-2807

# COLORFUL UTILITIES

**DOUBLE DOS** - Now access 10 more granules from your 40 track drive and still be compatible with RS DOS! Also works with double-sided and 80 track drives! DISK **$24.95**

**MULTI-PAK CRAK** - Save ROMPAKs to your 64K Disk system using the RS Multi-Pak Interface. Eliminate constant plugging in of ROMPAKs now by keeping all your PAK software on disk. DISK **$24.95**

**TAPE OMNI CLONE** - Easily handles programs with auto loaders, no headers, no EOF markers, unusual size blocks and more! Now is the time to get your tape software collection protected against loss. TAPE **$24.95**

**DISK OMNI CLONE** - Back everything up! This amazing program handles "non standard" disks with ease. We haven't found any disk yet that it can't handle. Lowest price too! 32K DISK **$29.95**

**DISK MANAGER** - Rescue crashed disks, date files on the disk directory, print a Super directory with ML addresses, maintain and sort a catalog of up to 300 files from a collection of disks! 16K DISK **$29.95**

**DISK UTIL** - A multi-featured enhancement that makes disk handling USER FRIENDLY. Utilize a directory window to sort and move file entries, backup by file or by track, interrogate disk sectors or the GAT table, single command execution of both BASIC and machine language programs plus much more! 64K DISK **$24.95**

**MASTER DESIGN** - Attention Telewriter 64 owners. Now you can create stunning block letter heads while text processing with Master Design. Full range of character sizes and graphic commands! DISK **$34.95**

**BASIC COMPILER** - Convert your BASIC programs into fast efficient machine language. Produces code more compact and up to 50Xs faster than original BASIC. Integer compiler with no Extended BASIC needed. 16K-64K versions included. TAPE **$39.95**

**SCHEMATIC DRAFTING** - Save hours of work and design professional looking electronic diagrams using a 480X540 pixel worksheet with 6 viewing windows. Over 30 electronic symbols with 10 user definable symbols are provided. Dump hard copy to the printer and save the created schematics to disk. 64K DISK **$49.95**

**PRITTY PRINTER** - An excellent utility... The breakdown of lines is much neater and easier to read than an LLIST printout... Allows for notes, comments and corrections to be easily and prominently placed. TAPE/DISK **$19.95** March'84 Rainbow

**MASTER MAIL** - Quite easy to use... Capable of handling 1000 addresses on a single disk... FORM LETTER allows you to produce multiple letters from the address database... A program for serious applications. 32K DISK **$49.95** Jan'84 Rainbow

**In Canada Call MICRO R.G.S. Toll Free 800-361-5155**

# COLORFUL UTILITIES

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**FAST DUPE** - The fastest Disk copier ever! Will format and backup a diskette in only one pass and can make up to 4 Disk copies at once! The must utility for every Disk owner. 64K DISK **$19.95**

---

**HIDDEN BASIC** - A protection feature for your BASIC programs. Modify your code so CLOAD, CSAVE, LIST, EDIT, DEL and LLIST will not function. TAPE **$19.95**

---

**64 COLUMN MOD I/III EMULATOR** - Give your CoCo a 64X16 screen. Run Model I/III BASIC graphic routines without retyping the graphics statements. 64K DISK **$19.95**

---

**64K DISK UTILITY PACKAGE** - Take advantage of an expanded 64K machine. Make an additional 8K of RAM available. Copy ROM cartridges to disk and create a 32K SPOOL buffer for printing. DISK **$21.95**

---

**TAPE UTILITY** - A powerful package that transfers tape to disk and disk to tape automatically. Does an automatic copy of an entire disk of programs and data to tape. TAPE/DISK **$24.95**

---

**E-X-T-E-N-D-E-D DISK BASIC** - Add new powerful commands to your 64K Disk system. Inverse Video (GREAT for monitors!), Wild Card Directory, Double POKE and PEEK, NSAVE, NLOAD, LDIR, OLD and TYPE. DISK **$24.95**

---

**GRAPHICOM** - The ultimate CoCo graphics development system with sophisticated graphics editing, preview animation, telecommunications and printer support. Hi-resolution graphics for only **$24.95.** W/Spectrum's Menu Foot Switch **$34.95.** 64K DISK

COLORFUL UTILITY CHECK LIST:

( ) DOUBLE DOS
( ) MULTI-PAK CRAK
( ) TAPE OMNI CLONE
( ) DISK OMNI CLONE
( ) DISK MANAGER
( ) DISK UTIL
( ) MASTER DESIGN
( ) BASIC COMPILER
( ) SCHEMATIC DRAFTING
( ) PRITTY PRINTER
( ) MASTER MAIL
( ) FAST DUPE
( ) HIDDEN BASIC
( ) 64 COL MOD I/III EMULATOR
( ) 64K DISK UTILITY PACKAGE
( ) TAPE UTILITY
( ) E-X-T-E-N-D-E-D DISK BASIC
( ) GRAPHICOM

See The Rainbow review of GEMINI 10X in this issue !

**SHIPPING $3.00 - NY RESIDENTS ADD SALES TAX**

## SPECTRUM PROJECTS

**WEST DIVISION**
**4285 PAYNE AVE/#9866**
**SAN JOSE, CA 95117**

**EAST DIVISION**
**PO BOX 21272**
**WOODHAVEN, NY 11421**

**212-441-2807**

```
260 ....... 183
490 ....... 255
END ...... 193
```

The listing:

```
10 POKE 65495,0
20 DIM B(6,5)
30 P=3:F=0:Q1=0:Q2=0:Q3=0:Q4=0:Q
5=0:Q6=0:WN=0
40 FOR W1=0 TO 6
50 FOR W2=0 TO 5
60 B(W1,W2)=0
70 NEXT W2
80 NEXT W1
90 PMODE 3,1:PCLS:SCREEN 1,0
100 FOR X=25 TO 200 STEP 25
110 LINE (X,40)-(X,190),PSET
120 NEXT X
130 FOR Y=65 TO 190 STEP 25
140 LINE (25,Y)-(200,Y),PSET
150 NEXT Y
160 IF P=6 THEN P=3: GOTO 180
170 IF P=3 THEN P=6
180 CIRCLE (38,28),11
190 PAINT (38,28),P,4
200 X=0:Y=0:C=0
210 A$=INKEY$
220 IF A$="!" THEN 30
230 IF A$="E" THEN POKE 65494,0:
END
240 IF A$=CHR$(8) THEN PAINT (38
+X,28),1,4:CIRCLE (38+X,28),11,1
:X=X-25:MP=1:GOTO 280
250 IF A$=CHR$(9) THEN PAINT (38
+X,28),1,4:CIRCLE (38+X,28),11,1
:X=X+25:MP=1:GOTO 280
260 IF A$=CHR$(10) THEN V=0:GOTO
 350
270 GOTO 210
280 IF 38+X<30 THEN X=0:CC=1
290 IF 38+X>195 THEN X=150:CC=1
300 IF MP=1 THEN CIRCLE (38+X,28
),11:PAINT (38+X,28),P,4
310 IF CC=1 THEN CC=0:MP=0
320 IF MP=1 AND A$=CHR$(8) THEN
C=C-1:MP=0
330 IF MP=1 AND A$=CHR$(9) THEN
C=C+1:MP=0
340 GOTO 210
350 FOR V=0 TO 4
360 IF B(C,0)<>0 THEN 210
370 IF B(C,V)<>0 THEN 390
380 NEXT V
390 IF B(C,V)<>0 THEN V=V-1
400 B(C,V)=P
410 VV=(V+1)*25
420 FOR Y=3 TO VV STEP 25:PAINT
(38+X,25+Y),1,4:CIRCLE (38+X,25+
Y),11,1:CIRCLE (38+X,50+Y),11:PA
INT (38+X,50+Y),P,4:NEXT Y
430 ' CHECK FOR 4 IN A ROW
440 IF V>2 THEN 460
450 IF B(C,V+1)=P AND B(C,V+2)=P
 AND B(C,V+3)=P THEN 710
460 FOR A=1 TO 3
470 IF C-A<0 OR Q1=1 THEN 490
480 IF B(C-A,V)=P THEN WN=WN+1 E
LSE Q1=1
490 IF C+A>6 OR Q2=1 THEN 510
500 IF B(C+A,V)=P THEN WN=WN+1 E
LSE Q2=1
510 IF WN=3 THEN 710
520 NEXT A
530 WN=0:Q1=0:Q2=0
540 FOR A=1 TO 3
550 IF C-A<0 OR V+A>5 OR Q3=1 TH
EN 570
560 IF B(C-A,V+A)=P THEN WN=WN+1
 ELSE Q3=1
570 IF C+A>6 OR V-A<0 OR Q4=1 TH
EN 590
580 IF B(C+A,V-A)=P THEN WN=WN+1
 ELSE Q4=1
590 IF WN=3 THEN 710
600 NEXT A
610 WN=0:Q3=0:Q4=0
620 FOR A=1 TO 3
630 IF C-A<0 OR V-A<0 OR Q5=1 TH
EN 650
640 IF B(C-A,V-A)=P THEN WN=WN+1
 ELSE Q5=1
650 IF C+A>6 OR V+A>5 OR Q6=1 TH
EN 670
660 IF B(C+A,V+A)=P THEN WN=WN+1
 ELSE Q6=1
670 IF WN=3 THEN 710
680 NEXT A
690 WN=0:Q5=0:Q6=0
700 GOTO 160
710 SCREEN 1,1
720 FOR R=1 TO 5
730 FOR E=1 TO 220 STEP 20:SOUND
 E,1:NEXT E
740 NEXT R
750 SCREEN 1,0
760 A$=INKEY$
770 IF A$="E" THEN POKE 65494,0:
END
780 IF A$="R" THEN 30
790 GOTO 760
```

# ..... A .....
# ..... SPECTRUM PROJECTS .....
# ..... SHOPPING LIST .....

## A Chip Off The Old...

| | |
|---|---|
| 6821 Standard PIA | $9.95 |
| 6822 Industrial Grade PIA | $14.95 |
| 6847 VDG Chip | $17.95 |
| 68764 (Fits Ext Basic Skt) Eprom | $24.95 |
| 64K RAM Checker (ROMPAK) | $24.95 |
| 16K-32K Upgrade Kit* | $25.95 |
| 6883 SAM Chip w/heat sink | $29.95 |
| 6809E CPU Chip | $29.95 |
| Basic ROM 1.2 Chip | $39.95 |
| Disk ROM 1.1 (New DOS Command) | $39.95 |
| 64K RAM Chips (Spectrum Special) | $49.95 |
| Extended Basic 1.1 ROM | $69.95 |
| CoCo First Aid Kit (Be Prepared) (2 6821's, 6809E & 6883) | $69.95 |
| Intronics Eprom Programmer- 15 seconds for a 68764! All popular EPROM's | $139.95 |

* NOT compatible with CoCo II

## CoCo Library...

| | |
|---|---|
| Color Computer Tech Manual | $7.95 |
| The World Connection - All about Bulletin Boards, Modems and the World's Most Famous Sysop (Bob Rosen)! | $9.95 |
| CoCo Memory Map | $12.00 |
| CoCo Secrets Revealed | $14.95 |
| Color Computer Interfacing | $14.95 |
| Basic 09 Tour Guide | $18.95 |
| CoCoINDX (1,800 articles) | $19.95 |
| New! CoCo II Service Manual | $19.95 |

## More Good Stuff...

| | |
|---|---|
| PBH Parallel Interface - Beats Botek! 300-9600 baud w/ptr-modem switch | $69.95 |
| The Spectrum Switcher - Have your Disk & Cartridge too! Dual Slot System | $69.95 |
| Colorama - The BEST CoCo BBS! | $99.95 |
| Disk Interface (Spectrum Special) | $139.95 |
| PBJ 80X24 Video Board | $139.95 |
| 64 K CoCo II (NO DISCOUNTS) | $239.95 |
| Banana Printer w/CoCo Interface | $259.95 |
| 5 Meg CoCo HARD Disk System | $1295.00 |

**All orders plus $3.00 S/H**
**NY Residents add sales tax**

## CoCo Cables And...

| | |
|---|---|
| Four Pin Male to Four Pin Female Extension- 15 feet. Move your printer or modem to another location | $14.95 |
| Tired of plugging and unplugging devices from the RS232 port? Make your life easier. Try our RS232 "Y" cable | $19.95 |
| OS-9 Null Modem Cable - Now timeshare with another CoCo or MC-10 | $19.95 |
| Spectrum Light Pen | $19.95 |
| Disk Interface/Rom Pak Extender - Move your disks and ROM Paks where you want them (3 feet) | $29.95 |
| Triple RS232 Switcher - Now select one of any three RS232 peripherals | $29.95 |
| 40 Pin Dual "Y" Cable | $29.95 |

## Other Good Stuff...

| | |
|---|---|
| C-10 tapes in any quantity | 49 cents |
| 5 1/4 Diskettes in any quantity | $1.99 |
| Joystick plug | $3.99 |
| 64K RAM Button | $4.99 |
| GEMINI 10X Ribbon | $4.99 |
| Epson MX/RX 80 Cartridge | $6.99 |
| Rompak w/Blank PC Board | $9.95 |
| RS Disk Controller Case | $9.95 |
| The Disk Doubler - Doubleside your 5 1/4 diskettes | $14.95 |
| Video Clear - Cleanup TVI !! | $19.95 |
| Cassette Recorder Stand- Put your CTR80 CCR81 at a 45 degree angle | $19.95 |
| The Data Defender- Store 75 diskettes in a hard plastic case w/key lock | $29.95 |
| CoCo Cooler (D & E Rev. boards) | $49.95 |
| New! CoCo Cooler II (CoCo II) | $49.95 |
| CoCo Stereo Music Synthesizer | $69.95 |

**SPECTRUM PROJECTS**

**EAST DIVISION :**
**PO BOX 21272**
**WOODHAVEN, NY 11421**
**WEST DIVISION :**
**4285 PAYNE AVE/#9866**
**SAN JOSE, CA 95117**

**(212) 441-2807**

16K
ECB

# THIS GUITAR TUTOR DOESN'T FRET

By Chris Phillips

One of the nicest things about CoCo is its patience as a tutor. The computer will instruct you as often as is needed for you to master the material. Then it will test you, proving to you what a good job it did. This program offers instruction and testing on guitar chords.

The program teaches major, minor, seventh, minor seventh, augmented and diminished chords in all twelve keys. It shows the fingering on the guitar neck and the notes on the bass and treble staffs. It also plays the notes.

In its testing mode, *Guitar Chords* displays the chord without the name in the upper left-hand corner. It keeps track of right and wrong answers.

# Custom Software Engineering, Inc.

807 Minutemen Causeway (D-2), Cocoa Beach, Florida 32931
(305) 783-1083 For information or technical support, please call between 5:30 and 8:30 P.M. Eastern time.

## DISK DATA HANDLER - 64K

*Provides the growth capability needed for your increasingly sophisticated applications.*

- Designed to use the full 64K RAM . . . may also be configured for 32K.
- Uses standard ROM's . . . No special operating system required!
- Allows you to design disk data files for your specific needs. You define a basic record of up to 14 fields and 246 characters.
- Provides fast selection and sorting based on any field or combination of fields in this record.
- Powerful in-screen input and update.
- User defined output of reports to screen, printer, or disk files which may be read by your BASIC programs for any computational or special formatting requirements.
- Printer reports allow headings, page breaks and page numbering, and let you pass control codes to drive your printer's special features.
- Maximum number of records you may work with at one time will depend on RAM configuration and record size . . . 64K (32K) 1850 (500) - 21 char records . . . 179 (49) -246 char records.
- An optional Extended record linked to the basic record may also be defined. Size of this Extended record is not a factor in determining maximum number of records.
- NOW . . . also includes DDH DIRECTORY FILE BUILDER . . . a listing of a short program to read directory information from your disks and produce a combined file index.

**$54.95** in BASIC with Machine Language subroutines.

## That's INTEREST-ing

*Let your computer do some REAL computation!*

- Helps you solve problems dealing with time, money, and INTEREST!
- Amortization tables any way YOU want them . . . even lets you change any terms mid-schedule!
- Calculates Present Value, Future Value, Capital Recovery for any combination of payments you specify.
- Rate of Return computation predicts how hard your money will be working for you!
- Computes Bond yields . . . current and to redemption.
- All answers available on screen or printer.

**$29.95** in BASIC

## MATH TUTOR

*5 programs in 1*

- Step by step approach . . . error correction.
- Goes from basic fact drill (+, –, x, /) to full addition, subtraction, multiplication, division.
- Four levels of difficulty.

**$13.95** in BASIC

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## SPELLING TEACHER

*Teaches YOUR word lists . . . suitable for any level from kindergarten to college!*

- Words presented in FOUR different modes . . . study, scrambled word game, trial test, and final test.
- Misspelled words are retaught to reinforce correct spelling.
- Tape or disk files store up to 200 words.

**$12.95** in BASIC

## DISK DOUBLE ENTRY

*If you have spent hours trying to balance your Debits and Credits, this program is for you!*

- Designed for small business, club and personal use.
- Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers.
- Will handle up to 300 accounts including report headings and totals.
- Up to 1400 average transactions on a diskette.
- Summary reports and four levels of subtotals available.
- Requires 32K and an understanding of standard double entry accounting concepts.

**$44.95** in BASIC with Machine Language subroutines.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## STATEMENT WRITER

*For use with (and requires) Disk Double Entry*

- Produces statements suitable for billing from your Receivables accounts.
- Provides mailing labels to use with your statements and account summaries.
- Designed and documented to allow you to change formats to accommodate your own special needs.

**$34.95**

## COMMAND STREAM PROCESSOR

*Powerful, versatile utility adds a new dimension to your Color Computer.*

- A program to run your other programs!
- Will allow you to prepackage a stream of direct system commands as well as INPUT and LINE INPUT to your BASIC program. This results in a totally automated stream of activity.
- If you understand your computer and the flow of activity required for your total operation, you are ready for the *power* of COMMAND STREAM PROCESSOR!

**$19.95** Completely relocatable . . . Machine Language

## GRAPHIC SCREEN PRINT PROGRAM

*Works in all PMODES and lets you shift screen image anywhere on the printed page.*

- Relocatable code lets you use all of your 16K or 32K machine.
- Available for Color Basic 1.0 and 1.1/1.2. Use EXEC 41175 to see which you have and SPECIFY WITH ORDER.
- SPECIFY PRINTER TYPE . . . in Machine Language

**$7.95** - TRS-80® LP-VII/VIII & DMP 100/200/400/420

**$9.95** - Epson GRAFTRAX®, NEC® PC 8023 A-C, IDS 440/445, Paper Tiger® 460/560, Micro Prism® 480, Prism® 80/132 (with dot plotting), TRS-80® DMP-120, TDP-1, PROWRITER® Centronics 739, Microline® 82A/83A (with Okigraph 1) /84/92/93, Star Micronics, Inc. GEMINI 10/10X/15 and Gorilla Banana.

(Trademarks of Tandy Corp., Epson America, Inc., C-Itoh, NEC America, Okidata Corp., Integral Data Systems, Inc.)

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## ALPHA-DRAW

*Works great with GRAPHIC SCREEN PRINT PROGRAM!*

- Subroutine designed to let you add any keyboard character to your graphic displays.
- You define X and Y coordinates and a string variable of one or more characters . . . ALPHA-DRAW does the rest!
- BONUS - includes instructions for a true line-numbered merge of tape files.

**$8.95** in BASIC

**RAINBOW**
**CERTIFICATION**
**SEAL**
ALL LISTED
PROGRAMS

ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

U.S. and CANADA add $1.00 per order for shipping. Overseas $2.50 per order. All prices in U.S. dollars. Florida residents add 5% sales tax. Return within two weeks if not completely satisfied.

For VISA and Master Card orders:
Include type, account number, expiration date, signature and phone number.
Sorry! No COD's.

The listing is documented, so the program should not be difficult to follow. The guitar neck is drawn in lines 1770-1790 and filled in with the finger markings in lines 480-590. The staffs are drawn in lines 1800-2160. Lines 770-1750 contain the subroutine that draws the letters and number in the chord names.

The program requires 32K, but it can be converted to 16K by removing the comment lines, deleting the *PCLEAR8*, and changing the *PMODE4,P* in line 390 to read *PMODE4,1*. In the 16K version, you watch the chord being drawn; in the 32K form, you see the previous chord until the new one has been prepared.

The program does not use the high speed *POKE65495,0*, as this would change the pitch of the notes.

If you would like *Guitar Chords* but want to save yourself the trouble of typing it into your CoCo, send me $4.95 to cover my costs and I'll send you a copy. Address: Chris Phillips, 11112 Monroe Street, Omaha, Neb., 68137. Please specify 32K or 16K version.

---

*(Chris Phillips is a public affairs specialist in Omaha, Nebraska. He enjoys writing educational software and is the author of Computer Island's* Graph Tutor.*)*

| | | | |
|---|---|---|---|
| 180 | 113 | 2060 | 2 |
| 370 | 141 | 2240 | 228 |
| 550 | 139 | 2380 | 98 |
| 890 | 151 | 2570 | 196 |
| 1010 | 70 | 2700 | 94 |
| 1380 | 29 | 2900 | 156 |
| 1610 | 169 | 3020 | 120 |
| 1900 | 126 | 3220 | 166 |
| | | END | 47 |

**The listing:**

```
10 'GUITAR CHORDS
20 'BY CHRIS PHILLIPS
30 'PCLEAR 8 BEFORE RUNNING
40 PCLEAR8
50 'RANDOMIZES
60 X=RND(-TIMER)
70 'C$(N)=NAME OF CHORD
80 'S(M,N)=FRET OF STRING M
90 'M$(N)=MUSIC TO PLAY
100 'SF(0,72)=ARRAY HOLDING
      GRAPHICS OF CLEFS
110 DIMC$(72),S(6,72),M$(72),SF(
0,72)
120 PMODE4,1:COLOR0,1:PCLS:SCREE
N1,1
130 'SUBROUTINE PRINTS LETTERS O
N     HIGH-RES SCREEN
140 'SK$=SCALE
150 'X=HORIZONTAL BEGINNING FOR
      WORD W$; Y=VERTICAL
160 SK$="8":X=26:Y=50:W$="GUITAR
 CHORDS":GOSUB790
170 'DRAWS GUITAR
180 LINE (120,100)-(115,110),PSE
T:LINE-(105,120),PSET:LINE-(95,1
25),PSET:LINE-(85,120),PSET:LINE
-(80,115),PSET:LINE-(78,110),PSE
T
190 LINE -(68,120),PSET:LINE-(53
,130),PSET:LINE-(43,120),PSET:LI
NE-(35,110),PSET:LINE-(35,90),PS
ET:LINE-(43,80),PSET:LINE-(53,70
),PSET:LINE-(68,80),PSET
200 LINE-(78,90),PSET:LINE-(80,8
5),PSET:LINE-(85,80),PSET:LINE-(
95,75),PSET:LINE-(105,80),PSET:L
INE-(115,90),PSET:LINE-(120,94),
PSET210 CIRCLE(90,98),6:PAINT(90
,98):LINE(50,90)-(53,108),PSET,B
220 SK$="4":X=120:Y=100:W$="by C
hris Phillips":GOSUB790
230 P=1
240 'LOADS CHORD INFO
250 FORN=1TO72
260 READ C$(N),S(1,N),S(2,N),S(3
,N),S(4,N),S(5,N),S(6,N),M$(N)
270 NEXT
280 'SUBROUTINE DRAWS MENU
290 GOSUB2900
300 'BEGINNING OF DISPLAY OF ALL
      CHORDS
310 CLS3
320 FORN=1TO72
330 'EXPLAINS HOW TO IDENTIFY
340 'THE CHORD
350 IF I=2THENCLS3:PRINT@258," P
RESS ANY KEY WHEN YOU ARE ";:PRI
NT@290," READY TO NAME THE CHORD
.    ";
360 'DRAWS DISPLAY BEFORE
370 'SHOWING IT
380 IFP=1THENP=5ELSEP=1
390 PMODE4,P:COLOR0,1:PCLS
400 'CR COUNTER IS USED TO SHOW
      A CHORD INCORRECTLY GUESSED
410 IFCR=1THEN450
420 'SKIPS PRINTING NAME OF
      CHORD TO BE GUESSED
430 IFI=2THEN470
440 'PRINTS NAME OF CHORD
450 W$=C$(N):SK$="12":X=0:Y=24:G
OSUB790
460 'SUBROUTINE DRAWS GUITAR
      NECK
470 GOSUB1770
480 'PLACES FINGER MARKINGS
490 FORS=1TO6
500 'PUTS X OVER UNPLAYED STRING
510 IFS(S,N)=9THENLINE(84+S*12,0
)-(92+S*12,8),PSET:LINE(84+S*12,
8)-(92+S*12,0),PSET:NEXTS
520 'PUTS O OVER OPEN STRING
530 IFS(S,N)=0THENCIRCLE(88+S*12
```

# "TRS-80 COLOR COMPUTER PRODUCTS"

## "ENHANCED 1248-EP EPROM PROGRAMMER"

The list of directly compatible EPROMs increases by one, now including: 2508's, 2758-0/1's, 2516's, 2716's, 2532's, 2732's, 68732-0/1's, 68764's, and 68766's.

### NEW FEATURES INCLUDE:

1) Intelligent algorithm that reduces programming time to as little as 1/6 that of fixed cycle programmers.
2) Diagnostic routines to isolate defective EPROMs, or locate differences.
3) A feature that guards against EPROM type entry errors.
4) Diagnostic routines that prevent keyboard entry errors from causing disastrous consequences.

### FIRMWARE FEATURES

1) EPROM ERASED!
2) COMPARE EPROM TO RAM!
3) BLOCK PROGRAMMING!
4) BYTE PROGRAMMING!
5) DUMP EPROM TO RAM!
6) JUMP!

Firmware is "stack-oriented", "position independent", and "menu driven". Supplied in an EPROM, it can also be stored on disc or tape for execution from RAM if desired.

### STANDARD HARDWARE FEATURES

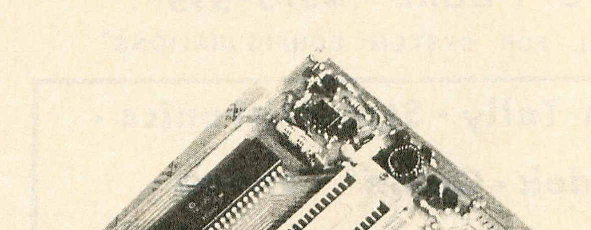
1) It has its own "on-board" 25 volt programming supply.
2) A quality textool "zero insertion force" (ZIF) socket.
3) Socket for firmware on-board.

A PIA port is also available on the programmer. This 8 bit parallel I/O port with handshake lines, can be used for many applications, such as a parallel printer port. Details on how to use this port as a printer interface are included in the instruction manual.

The instruction manual describes how to take full advantage of the power of this versatile programmer. We think you'll agree, that never before was an EPROM programmer so easy to use, and feature packed as is the 1248-EP.

The enhanced 1248-EP costs only $129.95.

Firmware upgrades are available to our previous 1248-EP customers, in EPROM, for just $29.95.



⁎ TRS-80 is a trademark of TANDY CORP.
⁎⁎ SDS80C is a trademark of the MICRO WORKS.

## "THE CK4 SERIES PROM/RAM CARDS"

The CK4 cards work with 2K, 4K, and 8K ROMs or EPROMs of the 5 volt only variety in 24 pin packages. The CK4 can also work with static RAMs, and increase your available memory by as much as 16,128 bytes.

The CK4-1 is specifically designed for use in computers with "F" series boards, or those machines that are "write protected" in the address range of $C000 through $FEFF. The CK4-1, therefore, does not incorporate features designed in the CK4 for use with RAM.

The CK4-2 is the unpopulated version of the CK4 series board. Buy this version and configure to meet your specific requirements, and stretch the value of your dollar.

### FEATURES SUMMARY

1) MIX ROM AND RAM!
2) EXPAND RAM FROM 2-16K!
3) YOU WRITE PROTECT RAM!
4) EXTREMELY FLEXIBLE DECODING!
5) PROVIDES FOR BATTERY BACKUP!
6) LOW COST!

### PRICES

CK-4 $29.95 ea. CK4-1 $27.95 ea. CK-2 $15.95 ea.

## NEW PRODUCT OFFERING

### A/D-80C ANALOG TO DIGITAL CONVERTER BOARD

The A/D-80C is a 16+ channel analog to digital converter with two 8 bit PIA ports plus handshake lines.

⁎Implement closed-loop control of analog processes!
⁎Use it to control your homes environment!
⁎Computerize your laboratory or darkroom!
⁎Build a multi-channel voltmeter!
⁎Use it for waveform generation!
⁎For robotics!

The A/D-80C is software programmable up to a maximum of 10 bits of resolution. The number of channels can be expanded beyond the 16 channel capability supplied, and the channels are software selectable.

The A/D-80C performs nearly 9K A/D conversions per second.

A generous area of the board is designated for wirewrapping to permit customization of analog signal processing circuitry.

Extensive documentation is provided to assist the user in the development of his application. Software listings are provided as an aid to software development, and a socket is provided for an EPROM for user developed software drivers.

CONSULT FACTORY FOR AVAILABILITY AND PRICE INFORMATION ON NEW PRODUCTS

## FACTORY FRESH COMPONENTS:

| ITEM | DESCRIPTION | PRICE |
|---|---|---|
| 2716 EPROM | 2K by 8 Bit, | $4.50 ea. |
| 2532 EPROM | 4K by 8 bit, | $6.50 ea. |
| 6821P | P.I.A. | $3.50 ea. |
| 74LS156 | Open collector decoder | $1.70 ea. |
| Socket | Textool "Zero Insertion Force" | $9.00 ea. |

Minimum component order: $25.00

## ORDERING INFORMATION:

Add $3.00 to all orders to cover shipping and handling. Canadian residents add 5% to cover special handling. Arizona residents add 5% sales tax. All items shipped UPS. Please allow 2-3 weeks for delivery. Prices subject to change without notice.

Make checks payable to:

**COMPUTER ACCESSORIES OF ARIZONA**
**5801 E. VOLTAIRE DRIVE**
**SCOTTSDALE, ARIZONA 85254**
**(602) 996-7569**

```
,4),4:NEXTS
540 IFS>6THEN610
550 'DRAWS FINGER MARKING
560 CIRCLE(88+S*12,4+S(S,N)*12),
4
570 PAINT(87+S*12,4+S(S,N)*12)
580 PAINT(89+S*12,4+S(S,N)*12)
590 NEXTS
600 'SUBROUTINE DRAWS STAFF
610 GOSUB1810
620 'DISPLAYS DRAWN SCREEN
630 SCREEN1,1
640 'PLAYS NOTES OF CHORD
650 PLAY"T4L4"+M$(N)
660 'PICKS NEW CHORD IF LAST ONE
     WAS INCORRECTLY GUESSED
670 IFCR=1THENCR=0:N=RND(48):GOT
O380
680 'ALLOWS RETURN TO MENU
690 IN$=INKEY$:IFIN$="M"THENIFI=
1THEN760ELSEGOTO2900
700 'GOES TO CHORD-NAMING STAGE
710 IFI=2THEN3070
720 'GOES TO CHORD-CHOOSING
     STAGE
730 IFI=3THENFORDL=1TO2000:NEXT:
GOTO3210
740 IFI>3THENRETURN
750 NEXT
760 RETURN
770 'LETTERS IN HIGH-RES ROUTINE
780 'SK SETS SCALE
790 SK=VAL(SK$)
800 FORL=1TOLEN(W$)
810 A$=MID$(W$,L,1)
820 'SP=SPACE
830 IFA$=" "THEN SP=1:GOTO1720
840 'LOWER-CASE LETTERS
850 IFASC(A$)>96THEN980
860 'SYMBOLS
870 IFASC(A$)<65THENGOTO940
880 'DUMMY NUMBERS KEEP PLACE
     FOR ON FORMAT WITH ASCII
     CODE
890 'UPPER-CASE LETTERS
900 ON ASC(A$)-64GOSUB1290,1310,
1330,1350,1370,1390,1410,1430,14
50,1330,1350,1370,1390,1410,1470
,1490,1470,1510,1530,1550,1570,1
570,1590,1610,1630,1650
910 NEXT
920 RETURN
930 'CHARACTERS AND NUMBERS
940 ON ASC(A$)-42 GOSUB1600,1880
,1620,1920,1940,1960,1980,2000,2
020,2040,2060,2080,1640,2120,214
0,2160,2180,1720,2200,2220,2240
950 NEXT
```

emerald computer services

*NORTHWEST COLOR COMPUTER CENTER* 206-778-9826*

PRINTERS + VIDEO MONITORS + DISKS

·64K COLOR COMPUTER 2 $255 · DRAGON 64 $299
·DRIVE 0 $375 - 395 · DRIVE 0/1 DUAL $575-595
·AMDISK 0/1 DUAL $595 "CALL FOR SYSTEM CONFIGURATIONS"

EPSON · Okidata · Mannesman Tally · Star Micronics · Transtar · Comrex · NEC · Amdek · Qume · Tandon · TEC · Teac · Panasonic · BMC · HJL · Hayes · Zenith · Softlaw · Computerware · Elite · Moreton Bay · C. Itoh · Mark Data · Homebase · Derringer ·

COMMODORE

LEADING EDGE PC
"IBM Compatible"

MORROW DESIGNS
micro DECISION

IBM PC JR

23215 58th W.
*Plaza Center
Mountlake Terrace, Wa 98043*

Master Card
VISA

SOFTWARE + COMPUTERS + MODEMS

COMPLETE SUPPORT FOR HOME, PERSONAL & BUSINESS USERS!

```
960 RETURN
970 'LOWER-CASE CHARACTERS
980 ON ASC(A$)-96 GOSUB1020,1040
,660,1060,700,720,1080,1100,1120
,800,820,1140,1160,880,900,1180,
940,1200,1220,1000,1240,1040,106
0,1080,1260,1120
990 NEXT
1000 RETURN
1010 'LOWER-CASE CHARACTERS
     START HERE
1020 L$="U2R3U2L3R3D3NF1G1L1"
1030 GOTO1670
1040 L$="R3E1U2H1L2U2NL1D6"
1050 GOTO1670
1060 L$="BU1U2E1R2U2NR1D6NR1L2H1
"
1070 GOTO1670
1080 L$="BD1D1R3E1U1H1L2H1U1E1R1
F1NE1D1G1"
1090 GOTO1670
1100 L$="R1U6NL1D2R2F1D3L1"
1110 GOTO1670
1120 L$="BR1R2L1U3BU2U1"
1130 GOTO1670
1140 L$="BR1R1U6L1BR1BD6R1"
1150 GOTO 1670
1160 L$="U3NU1E1F1ND3E1F1D3"
1170 GOTO1670
```

```
1180 L$="BU4R3F1D2G1L2NU4D2"
1190 GOTO1670
1200 L$="NR1U4BD2E2R1F1"
1210 GOTO1670
1220 L$="R3E1H1L2H1E1R3"
1230 GOTO1670
1240 L$="NU4R2E1R1ND1U3"
1250 GOTO1670
1260 L$="BU2NU2F2R2NU4D1G1L3"
1270 GOTO1670
1280 'UPPER-CASE CHARACTERS
     START HERE
1290 L$="U4E2F2D2NL4D2"
1300 GOTO1670
1310 L$="R3E1U1H1E1U1H1L3R1D3NR2
D3"
1320 GOTO1670
1330 L$="BE4BU1H1L2G1D4F1R2E1"
1340 GOTO1670
1350 L$="R3E1U4H1L2NL1D6"
1360 GOTO1670
1370 L$="R4U1BU4U1L3NL1D3NR2D3"
1380 GOTO1670
1390 L$="R1NR1U3NR2U3NL1R3D1"
1400 GOTO1670
1410 L$="BE2R1NR1D1ND1G1L1H1U4E1
R2D1"
1420 GOTO1670
1430 L$="U3NU3R4NU3D3"
```

PERRY COMPUTERS

COLOR COMPUTERS

CALL TOLL FREE 1-800-248-3823

COLOR COMPUTER, DISK DRIVE AND PRINTERS

| | LIST PRICE | OUR PRICE |
|---|---|---|
| 26-3027 16K Color Computer 2 | $ 199.00 | $ 169.00 |
| 26-3127 64K Color Computer 2 | $ 259.00 | $ 220.00 |
| 26-3029 Disk Drive 0 | $ 399.00 | $ 310.00 |
| 26-3023 Disk Drive 1, 2, 3 | $ 279.95 | $ 230.00 |
| 26-1271 DMP-110 | $ 399.00 | $ 310.00 |
| 26-1255 DMP-120 | $ 499.00 | $ 400.00 |
| 26-1254 DMP-200 | $ 699.00 | $ 520.00 |
| 26-1257 DWP-210 | $ 799.00 | $ 630.00 |

COLOR COMPUTER SOFTWARE

| | OUR PRICE |
|---|---|
| Telewriter 64 Tape | $ 49.95 |
| Telewriter 64 Disk | $ 59.95 |
| VIP Writer | $ 59.95 |
| VIP Speller | $ 49.95 |
| VIP Database | $ 59.95 |
| RADIO SHACK Software | 15% Off |
| TOM MIX Software | $ CALL |
| SPECTRAL ASSOCIATES | $ CALL |

OTHER PRINTERS AND ACCESSORIES

| | OUR PRICE |
|---|---|
| EPSON Printer | $ CALL |
| OKIDATA Printer | $ CALL |
| STAR GEMINI 10X Printer | $ 300.00 |
| TRANSTAR Daisy Wheel Printer | $ 465.00 |
| C.ITOH 8510 Prowriter Printer | $ 380.00 |
| BOTEK Serial to Parallel Interface | $ 59.00 |

MONITORS

| | OUR PRICE |
|---|---|
| COMREX 12″ Monitor | $ 95.00 |
| COMREX 13″ Color Monitor | $ 285.00 |
| AMDEK 300A Monitor | $ 155.00 |
| AMDEK Color I Plus | $ 335.00 |
| VIDEO PLUS Monitor Adaptor | $ CALL |
| GORILLA Monitor | $ 85.00 |

COLOR ACCESSORIES

| | LIST PRICE | OUR PRICE |
|---|---|---|
| 26-2226 RS-232 Program Pak | $ 79.95 | $ 68.00 |
| 26-3012 Deluxe Joystick (EACH) | $ 39.00 | $ 34.00 |
| 26-3017 64K RAM Kit | $ 69.95 | $ 59.00 |
| 26-3025 Color Mouse | $ 49.95 | $ 42.50 |
| 26-1173 Modem II | $ 199.95 | $ 169.00 |

| | LIST PRICE | OUR PRICE |
|---|---|---|
| 26-3008 Joysticks | $ 24.95 | $ 21.00 |
| 26-3016 Keyboard Kit | $ 39.95 | $ 34.00 |
| 26-3018 Ext. BASIC Kit | $ 39.95 | $ 34.00 |
| 26-1175 Modem I | $ 99.95 | $ 85.00 |
| Hayes Modems | | $ CALL |

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. (Installation and shipping are not included in price.)

C.O.D., Visa, MasterCharge, and American Express welcome. Please call (517) 625-4161 for free price list or information.

PERRY COMPUTERS • DEPT. NO. A1 • 137 NORTH MAIN STREET • PERRY, MI 48872

```
1440 GOTO1670
1450 L$="BR1R1NR1U6NL1R1"
1460 GOTO1670
1470 L$="BU1U4E1R2F1D4G1L2H1"
1480 GOTO1670
1490 L$="R1NR1U6NL1R2F1D1G1L2"
1500 GOTO1670
1510 L$="U6R3F1D1G1L1NL2F2D1"
1520 GOTO 1670
1530 L$="BU1F1R2E1U1H1L2H1U1E1R2
F1"
1540 GOTO1670
1550 L$="BR2U6NL2R2"
1560 GOTO1670
1570 L$="BU1NU5F1R1E1R1ND1U5"
1580 GOTO1670
1590 'CHARACTERS AND NUMBERS
     START HERE
1600 L$="BR1U2NL1NR3U2NL1NU2R2NU
2NR1D4"
1610 GOTO1670
1620 L$="R2E1U1H1L2ND3U3"
1630 GOTO1670
1640 L$="E4U2L4D1"
1650 GOTO1670
1660 'POSITIONS THE BOTTOM-LEFT
     HAND CORNER OF THE CHAR-
     ACTER'S 5 X 7 MATRIX
1670 DRAW"BM"+STR$(X)+","+STR$(Y
)+";"
1680 'DETERMINES SCALE
1690 DRAW"S"+SK$
1700 DRAWL$
1710 'MOVES REFERENCE POINT TO
     NEXT LETTER LOCATION
1720 X=INT(X+1.8*SK):IFX>256-2*S
K THENX=0:Y=Y+3*SK
1730 'RETURNS SPACE-SIGNAL TO 0
1740 IFSP=1THENSP=0:NEXT
1750 RETURN
1760 'DRAWS GUITAR NECK
1770 FORX=100TO160STEP12:LINE(X,
10)-(X,78),PSET:NEXT
1780 FORY=10TO70STEP12:LINE(100,
Y)-(160,Y),PSET:NEXT
1790 RETURN
1800 'DRAWS STAFF
1810 FORLN=108TO138STEP8
1820 LINE(10,LN)-(244,LN),PSET
1830 NEXT
1840 FORLN=148TO172STEP8
1850 LINE(10,LN)-(244,LN),PSET
1860 NEXT
1870 'CH=HORIZONTAL POSITION OF
      NOTE: CV=VERTICAL
1880 CH=50:LINE(10,100)-(244,180
),PSET,B
1890 'SKIPS CLEF-DRAWING IF
      ALREADY IN ARRAY
1900 IFK=1THEN1970
1910 'DRAWS TREBLE CLEF
1920 LINE(20,134)-(20,136),PSET:
LINE-(24,132),PSET:LINE-(14,100)
,PSET:LINE-(18,94),PSET:LINE-(22
,100),PSET:LINE-(12,116),PSET:LI
NE-(18,132),PSET:LINE-(26,124),P
SET:LINE-(24,116),PSET:LINE-(16,
118),PSET
1930 LINE(16,158)-(12,154),PSET:
LINE-(12,152),PSET:LINE-(20,148)
,PSET:LINE-(22,156),PSET:LINE-(2
0,164),PSET:LINE-(12,176),PSET:C
IRCLE(26,152),2:CIRCLE(26,160),2
1940 'STORES GRAPHICS INTO ARRAY
1950 GET(12,90)-(30,178),SF,G
1960 K=1
1970 PUT(12,90)-(30,178),SF,PSET
1980 'THIS ROUTINE DRAWS THE
      NOTES
1990 FORQ=1TOLEN(M$(N))
2000 IFMID$(M$(N),Q,1)="O"THEN O
C=VAL(MID$(M$(N),Q+1,1)):Q=Q+2
2010 NT=ASC(MID$(M$(N),Q,1))
2020 IFNT>71ORNT<65THEN2150
2030 'BECAUSE OCTAVES BEGIN WITH
      C; ASC CODE WITH A
2040 IFNT<67THENOK=1ELSEOK=0
2050 'CODE FOR SHARPS OR FLATS
2060 SG=0:IFMID$(M$(N),Q+1,1)="+
"THENSG=1ELSEIFMID$(M$(N),Q+1,1)
="-"THENSG=2
2070 IFSG=0THEN2080ELSECH=CH+10
2080 CH=CH+20:NT=NT-65:CV=232-(O
C+OK)*28-NT*4:CIRCLE(CH,CV),4
2090 'THIS PUTS TAILS ON THE
      NOTES
2100 IF CV<117OR(CV>143ANDCV<165
)THEN LINE(CH-4,CV)-(CH-4,CV+24)
,PSET ELSE LINE(CH+4,CV)-(CH+4,C
V-24),PSET
2110 'DRAWS SHARP SIGN
2120 IFSG=1THENLINE(CH-12,CV-6)-
(CH-12,CV+6),PSET:LINE(CH-8,CV-6
)-(CH-8,CV+6),PSET:LINE(CH-14,CV
-2)-(CH-6,CV-4),PSET:LINE(CH-14,
CV+4)-(CH-6,CV+2),PSET
2130 'DRAWS FLAT SIGN
2140 IFSG=2THENLINE(CH-12,CV-12)
-(CH-12,CV+4),PSET:LINE-(CH-6,CV
-1),PSET:LINE-(CH-12,CV-4),PSET
2150 NEXT
2160 RETURN
2170 DATAG,3,2,0,0,0,3,O2GBO3DGB
O4G
2180 DATAA-,4,6,6,5,4,4,O2A-O3E-
A-O4CE-A-
2190 DATAA,0,0,2,2,2,0,O2EAO3EAO
4C+E
2200 DATAB-,1,1,3,3,3,1,O2FB-O3F
B-O4DF
```

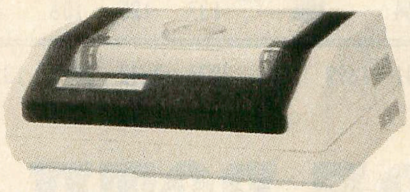
# DSL COMPUTER PRODUCTS

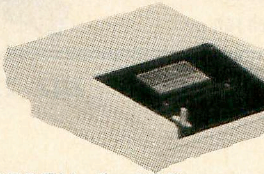
## TDP CLEARANCE SALE

16K STANDARD $125
16K EXTENDED $175
64K STANDARD $185
64K EXTENDED $235

COMPUTER ONLY
no cables manuals etc.
16K STANDARD $99
*FREE* DUST COVER W/ COMPUTER

TDP LINE PRINTER I
ONLY $175
INCLUDES *FREE*
*WORD PROCESSOR
*GRAPHIC SCREEN DUMP
*MAILLIST
*PRINTER TEST
FREE PROGRAMS NEED EXT.





MODEM I $88

COLOR GRAPHIC PRINTER
ONLY $75
INCLUDES *FREE*
*WORD PROCESSOR
*GRAPHIC SCREEN PRINT
*MAILLIST
*PRINTER DEMO

## SYSTEM PACKAGE

16K EXTENDED TDP 100 * 4-COLOR GRAPHIC PRINTER * CASSETTE RECORDER
2 JOYSTICKS * BUSTOUT CARTRIDGE * DUST COVER * 2 C-20 CASSETTES$* 3 MANUALS
31 PROGRAMS ON CASSETTE * CASSETTE CABLE * PRINTER CABLE * RAINBOW MAGAZINE
ONLY $299
FOR 64K RATHER THEN 16K ADD $50 TOTAL PACKAGE $349

## C-20 LEADERLESS CASSETTES

CT-20 CERTIFIED COMPUTER CASSETTE TAPES * SOLD AS HIGH AS $3.79 EACH
ONLY $2.25 EACH * BOX OF 12 ONLY $24 * CT-10 W/LEADER $1.00 EACH

## TDP ROM PACKS

BUSTOUT * PROJECT NEBULA * PERSONAL FINANCE * MICRO PAINTER
POLARIS * SHOOTING GALLERY * SPACE ASSUALT * MICROBES * SPECTACULATOR
or COLOR SCRIPSIT ONLY $9.95 EACH WHILE SUPPLY LASTS

## DUST COVERS

DUST COVERS FOR THE TDP-100 OR ORIGINAL COLOR COMPUTER ONLY $3.00

## WARNING

ALL ITEMS LISTED IN THIS AD ARE IN LIMITED QUANTITY ONCE SOLD THERE ARE NO MORE!
PLEASE ADD $2 FOR SHIPPING & HANDLING * ADD $5 (S&H) FOR EACH COMPUTER
MI. RES. ADD 4% SALES TAX * ALLOW 2 WEEKS FOR PERSONAL CHECKS TO CLEAR

P.O. BOX 1113 • DEARBORN, MI 48121 • (313)582-8930

see us at RAINBOWfest CHICAGO

| 1983 unit sales | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total | Average | Best | Worst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bach | 136 | 139 | 119 | 161 | 130 | 104 | 84 | 121 | 95 | 115 | 75 | 161 | 1440 | | 161 | 75 |
| Chalone | 120 | 170 | 152 | 170 | 182 | 102 | 89 | 157 | 162 | 129 | 64 | 158 | | | 182 | 64 |
| Dolan | 188 | 157 | 103 | 112 | 161 | 122 | 99 | 145 | 145 | 103 | | | | | 188 | 97 |
| Feagan | 105 | 94 | 127 | 115 | 157 | 97 | 61 | 132 | 113 | | | | | | 174 | 61 |
| Graham | 135 | 135 | 183 | 116 | 151 | 104 | 86 | 149 | | | | | | | 183 | 63 |
| Harpel | 134 | 102 | 190 | 161 | 180 | 85 | | | | | | | | | | |
| Jordan | 105 | 109 | 188 | 171 | 120 | | | | | | | | | | | |
| Latour | 112 | 128 | 124 | 129 | | | | | | | | | | | | |
| Lucido | 158 | 110 | | | | | | | | | | | | | | |
| Phelps | 167 | | | | | | | | | | | | | | | |
| Prats | | | | | | | | | | | | | | | | 75 |
| Schaeferle | | | | | | | | | | | | | | | 193 | 78 |
| Taylor | | | | | | | | | | | | | | 145 | 190 | 88 |
| Torres | | | | | 131 | | | | | | | | 1620 | 135 | 177 | 105 |
| Turner | | | | 127 | 131 | | | | | | 75 | 178 | 1635 | 136 | 190 | 75 |
| Wehlen | | | 145 | 142 | 154 | | | 137 | 125 | 106 | 60 | 151 | 1495 | 125 | 154 | 60 |
| | 2312 | 2166 | 2387 | 2321 | 2401 | 1699 | 1439 | 2276 | 2242 | 2011 | 1318 | 2631 | 25203 | 2100 | | |

# DYNACALC®
# FOR CoCo DOS

NO OTHER OPERATING SYSTEM NEEDED!

# THE BEST OF BOTH WORLDS!

see us at RAINBOWfest CHICAGO

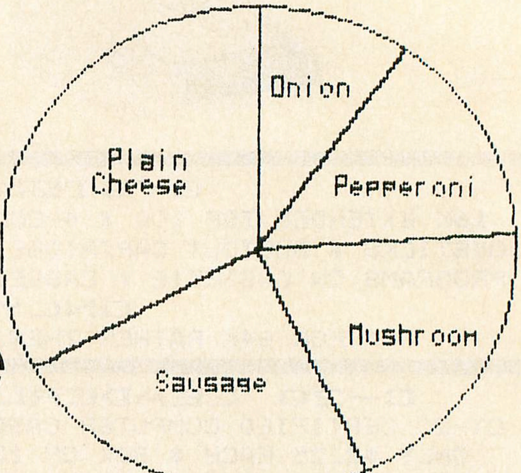
available from

CSC

COMPUTER SYSTEMS CENTER
13461 Olive Blvd.
Chesterfield, MO 63017 USA
(314) 576-5020

MasterCard VISA

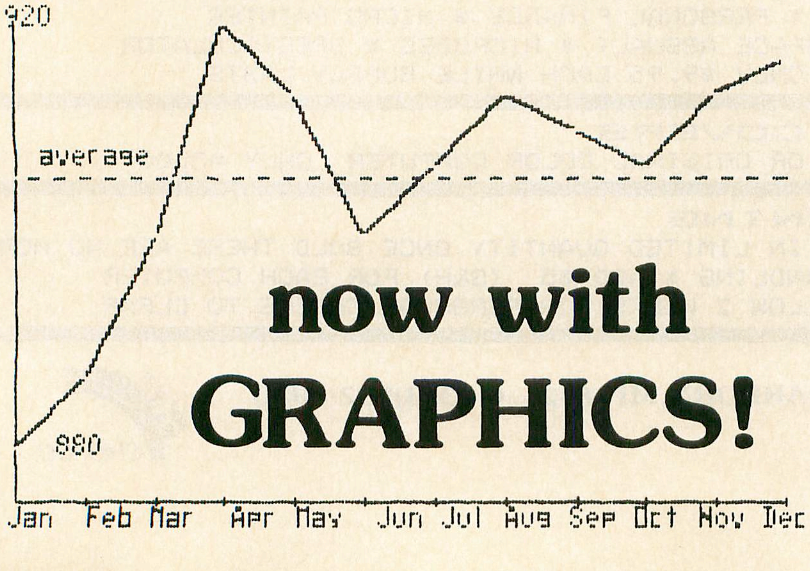
or your local DYNACALC dealer



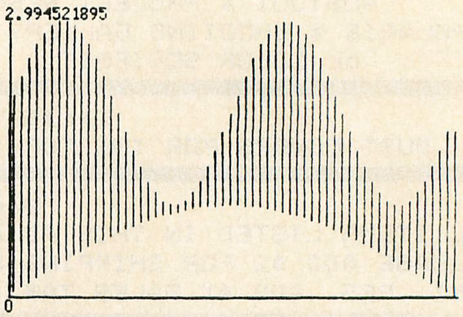
Price $150 postpaid in US & Canada.
Outside North America add $10 postage.

RAINBOW CERTIFICATION SEAL

DYNACALC Reg. U. S. Pat. Off.



## now with GRAPHICS!



CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

```
2210 DATAB,2,2,4,4,4,2,O2G-BO3G-
BO4E-G-
2220 DATAC,3,3,2,0,1,0,O2GO3CEGO
4CE
2230 DATAC+,4,4,3,1,2,1,O2G+O3C+
FG+O4C+F
2240 DATAD,9,0,0,2,3,2,O2AO3DAO4
DF+
2250 DATAE-,9,1,1,3,4,3,O2B-O3E-
B-O4E-G
2260 DATAE,0,2,2,1,0,0,O2EBO3EG+
BO4E
2270 DATAF,1,3,3,2,1,1,O2FO3CFAO
4CF
2280 DATAF+,2,4,4,3,2,2,O2F+O3C+
F+A+O4C+F+
2290 DATAGm,3,5,5,3,3,3,O2GO3DGB
-O4DG
2300 DATAA-m,4,6,6,4,4,4,O2A-O3E
-A-BO4E-A-
2310 DATAAm,0,0,2,2,1,0,O2EAO3EA
O4CE
2320 DATAB-m,1,1,3,3,2,1,O2FB-O3
FB-O4D-F
2330 DATABm,2,2,4,4,3,2,O2F+BO3F
+BO4DF+
2340 DATACm,3,3,5,5,4,3,O2GBO3GO
4CE-G
2350 DATAC+m,4,4,6,6,5,4,O2G+O3C
G+O4C+EG+
2360 DATADm,9,0,0,2,3,1,O2AO3DAO
4DF
2370 DATAE-m,9,1,1,3,4,2,O2B-O3E
-A-O4E-G-
2380 DATAEm,0,2,2,0,0,0,O2EBO3EG
BO4E
2390 DATAFm,1,3,3,1,1,1,O2FO3CFG
+O4CF
2400 DATAF+m,2,4,4,2,2,2,O2F+O3C
+F+AO4C+F+
2410 DATAG7,3,2,0,0,0,1,O2GBO3DG
BO4F
2420 DATAA-7,4,6,4,5,4,4,O2A-O3E
-G-O4CE-A-
2430 DATAA7,0,0,2,0,2,0,O2EAO3EG
O4C+E
2440 DATAB-7,1,1,3,1,3,1,O2FB-O3
FA-O4DF
2450 DATAB7,2,2,1,2,0,2,O2F+BO3D
+ABO4F+
2460 DATAC7,3,3,2,3,1,0,O2GO3CEA
+O4CE
2470 DATAC+7,4,4,3,4,2,1,O2G+O3C
+FBO4C+F
2480 DATAD7,9,0,0,2,1,2,O2AO3DAO
4CF+
2490 DATAE-7,9,1,1,3,2,3,O2B-O3E
-B-O4D-G
2500 DATAE7,0,2,0,1,0,0,O2EBO3DG
+BO4E
```

```
2510 DATAF7,1,3,1,2,1,1,O2FO3CD+
AO4CF
2520 DATAF+7,2,4,2,3,2,2,O2F+O3C
+EA+O4C+F+
2530 DATAGm7,3,5,3,3,3,3,O2GO3DF
B-O4DG
2540 DATAA-m7,4,6,4,4,4,4,O2A-O3
E-G-BO4E-A-
2550 DATAAm7,0,0,2,0,1,0,O2EAO3E
GO4CE
2560 DATAB-m7,1,1,3,1,2,1,O2FB-O
3FA-O4D-F
2570 DATABm7,2,2,4,2,3,2,O2F+BO3
F+AO4DF+
2580 DATACm7,3,3,5,3,4,3,O2GBO3G
B-O4E-G
2590 DATAC+m7,4,4,6,4,5,4,O2G+O3
CG+BO4EG+
2600 DATADm7,9,0,0,2,1,1,O2AO3DA
O4CF
2610 DATAE-m7,9,1,1,3,2,2,O2B-O3
E-A-O4D-G-
2620 DATAEm7,0,2,0,0,0,0,O2EBO3D
GBO4E
2630 DATAFm7,1,3,1,1,1,1,O2FO3CE
-G+O4CF
2640 DATAF+m7,2,4,2,2,2,2,O2F+O3
C+EAO4C+F+
2650 DATAGaug,9,9,5,4,4,3,O3GBO4
D+G
2660 DATAAbaug,9,9,6,5,5,4,O3A-O
4CEF+
2670 DATAAaug,9,9,3,2,2,1,O3FAO4
C+F
2680 DATAB-aug,9,9,4,3,3,2,O3G-B
-O4DG-
2690 DATABaug,9,9,5,4,4,3,O3GBO4
D+G
2700 DATACaug,9,9,6,5,5,4,O3A-O4
CEG-
2710 DATAC+aug,9,9,3,2,2,1,O3FAO
4C+F
2720 DATADaug,9,9,4,3,3,2,O3F+A+
O4DF+
2730 DATAE-aug,9,9,5,4,4,3,O3GBO
4E-G
2740 DATAEaug,9,9,6,5,5,4,O3G+O4
CEF+
2750 DATAFaug,9,9,3,2,2,1,O3FAO4
C+F
2760 DATAF+aug,9,9,4,3,3,2,O3F+A
+O4DF+
2770 DATAGdim,9,9,2,3,2,3,O3EA+O
4C+G
2780 DATAG+dim,9,9,3,4,3,4,O3E+B
O4DG+
2790 DATAAdim,9,9,1,2,1,2,O3D+AO
4CF+
2800 DATAB-dim,9,9,2,3,2,3,O3EB-
O4D-G
```

## Free

## PASS—THE—HAT SOFTWARE

### SPELL 'N FIX II

SPELL 'N FIX II is not just for spelling mistakes — it catches typos too. Regardless of whose text processor you use, let SPELL 'N FIX II find and fix your spelling and typing mistakes, and your word processing output will look professional and be perfect. It finds mistakes even experienced proofreaders often miss.

SPELL 'N FIX II is easy to use. As it proofreads your text file, it displays it (in full upper and lower case) right on the screen for you to see. It looks up each word in the text in its own computerized dictionary file (which is compressed and indexed to save space on the disk and make access super fast) and tells you whenever it finds a word which is not in the dictionary. At this point, you have several options - let it be (if it's OK), add it to the dictionary (if it's a word you expect to use often), or change it (if it's wrong). If you decide to change it, then SPELL 'N FIX II even helps you find the correct spelling in the computerized dictionary, or you can use an entirely new word or phrase. If you make a change, SPELL 'N FIX II will look it up in the dictionary one more time to check up on your typing. Once you make a change, SPELL 'N FIX II will then remind you about it the next time it sees the same wrong word in your text.

Since the computerized dictionary is expandable, you can customize it with your own pet words or technical terms, and can even develop specialized dictionaries for special uses or foreign languages.

SPELL 'N FIX II is part of our Pass-the-Hat (tm) program. If you send us a disk and stamped mailer for it, we will send you a copy of SPELL 'N FIX II with a request that you send us a fair contribution after you have had a chance to evaluate the program.

SPELL 'N FIX II is available on disk only. For tape systems, order SPELL 'N FIX I at $49.39; CoCo version for Flex or STAR-DOS disk operating systems costs $89.29.

### EARN $1 ... IF YOU CAN!

What do Absorbancy, Accidently, Solicarity, Pickpicketing, Technacalities, and Reprhasing have in common? They are all misspelled words in our competitors' dictionaries!

We've taken great pains to make sure the dictionary file of SPELL 'N FIX II has no mistakes. We're so confident about it that we will pay you $1 for every misspelled word you can find in it. I don't expect this offer to cost us a cent, but in case several people find the same word, the earliest postmark wins.

### HUMBUG® — THE SUPER MONITOR

A complete monitor and debugging system which lets you input programs and data into memory, list memory contents, insert multiple breakpoints, single-step, test, checksum, and compare memory contents, find data in memory, start and stop programs, upload and download, save to tape, connect the Color Computer to a terminal, printer, or remote computer, and more. HUMBUG on disk or cassette costs just $39.95, special 64K version for FLEX or STAR-DOS 64 costs $59.95, MC-10 version $29.95.

### STAR—DOS

A Disk Operating System specially designed for the Color Computer, STAR-DOS is fully compatible with your present Color Computer disk format — it reads disks written by Extended Disk Basic and vice versa. STAR-DOS for 16K through 64K systems costs $49.90. STAR—DOS Level I for 6809 SS-50 systems costs $75.

### ALL-IN-ONE

Text editor, processor, and mailing list program combines three most used functions in one program. Requires STAR-DOS or FLEX. $50.

### CHECK 'N TAX

Home accounting package combines checkbook maintenance and income tax data collection. Written in Basic for either RS Disk or Flex, $50.

### REMOTERM

REMOTERM — makes your CoCo into a host computer, operated from a remote terminal. $19.95, disk or cassette.

### COMMTERM

A terminal program for your CoCo or MC-10. Part of our Pass-the-Hat software program. Send a cassette and stamped envelope for your free copy.

### NEWTALK

NEWTALK — a memory examine utility for machine language programmers which reads out memory contents through the TV set speaker. $20, disk or cassette.

### SHRINK

SHRINK — our version of Eliza, in machine language and extremely fast. $15, disk or cassette.

### EDUCATIONAL SOFTWARE

Introduction to Numerical Methods — college level course on computer math, $75.00, disk or cassette.

### DOUBLE SIDED DISK SYSTEM

Complete disk system with double-sided drive, cabinet, power supply, cable, and controller, $400. A half-height drive in full size cabinet (has room for a second drive for future expansion) costs $25 extra. Either way, you get double the storage capacity - 320K on one disk.

We accept cash, check, COD, Visa, or Master Card. NY State residents please add appropriate sales tax. Add $3 to above price for AMDEK 3" disk versions.

(FLEX is a trademark of Technical Systems Consultants, Inc. Everything else in this ad is a trademark of Star-Kits.)

**STAR-KITS**
SOFTWARE SYSTEMS CORPORATION

PO BOX 209R MT KISCO NY 10549 (914) 241-0287

```
2810 DATABdim,9,9,3,4,3,4,03FB04
DG+
2820 DATACdim,9,9,1,2,1,2,03D+A0
4CF+
2830 DATAC+dim,9,9,2,3,2,3,03EA+
04C+G
2840 DATADdim,9,9,3,4,3,4,03FB04
DG+
2850 DATAE-dim,9,9,1,2,1,2,03E-A
04CG-
2860 DATAEdim,9,9,2,3,2,3,03EA+0
4C+G
2870 DATAFdim,9,9,3,4,3,4,03FB04
DG+
2880 DATAF+dim,9,9,1,2,1,2,03D+A
04CF+
2890 'DRAWS MENU
2900 CLS:FORQ=1024TO1056:POKEQ,1
91:POKEQ+480,191:NEXT:FORQ=1056T
01472STEP32:POKEQ,191:POKEQ+31,1
91:NEXT
2910 PRINT@66,"WHAT WOULD YOU LI
KE TO DO?";
2920 PRINT@132,"1-SEE ALL CHORDS
";
2930 PRINT@164,"2-IDENTIFY A CHO
RD";
2940 PRINT@196,"3-SEE A PARTICUL
AR CHORD";
2950 PRINT@228,"4-SEE MAJOR CHOR
DS";
2960 PRINT@260,"5-SEE MINOR CHOR
DS";
2970 PRINT@292,"6-SEE SEVENTH CH
ORDS";
2980 PRINT@324,"7-SEE MINOR SEVE
NTH CHORDS";
2990 PRINT@356,"8-SEE AUGMENTED
CHORDS";
3000 PRINT@388,"9-SEE DIMINISHED
 CHORDS";
3010 PRINT@418,"HOLD DOWN 'M' AF
TER MUSIC TO";:PRINT@454,"RETURN
 TO THIS MENU";
3020 I$=INKEY$:IFI$=""THEN3020
3030 I=VAL(I$):ON I GOSUB310,306
0,3210,3340,3340,3340,3340,3340,
3340,3340
3040 GOTO2900
3050 'GUESSING SUBROUTINE
3060 N=RND(48):GOTO350
3070 IN$=INKEY$:IFIN$=""THEN3070
3080 CLS:PRINT@65,"WHAT IS THE C
HORD (USE + FOR     SHARP, - FOR
FLAT, MIN FOR       MINOR, MIN7 F
OR MINOR 7TH)        -FOR EXAMPLE
, B-7, F+ MIN7-         ";
3090 INPUTGS$
3100 'SAVES ORIGINAL FORMAT FOR
      PRINTING IF GUESS IS WRONG
3110 D$=C$(N)
3120 FORX=1TOLEN(C$(N))
3130 IFMID$(C$(N),X,1)="m"ANDX=L
EN(C$(N))THENMID$(C$(N),X,1)=" "
:C$(N)=C$(N)+"MIN"ELSEIFMID$(C$(
N),X,1)="m"THENC$(N)=LEFT$(C$(N)
,LEN(C$(N))-2)+" MIN7"
3140 NEXT
3150 'KEEPS SCORE
3160 TT=TT+1
3170 IFGS$=C$(N)THENPRINT" THAT'
S RIGHT!":SC=SC+1:GOSUB3320ELSEP
RINT" NO, THE CHORD IS ";C$(N):G
OSUB3320:FORDL=1TO2000:NEXT:CR=1
:C$(N)=D$:GOTO390
3180 N=RND(48)
3190 GOTO390
3200 'CHOOSE-A-CHORD SUBROUTINE
3210 CLS3:PRINT@98," WHICH CHORD
 WOULD YOU LIKE ";:PRINT@130," T
O SEE (USE + FOR SHARP, - ";:PRI
NT@162," FOR FLAT, MIN FOR MINOR
,    ";:PRINT@194," DIM FOR DIMIN
ISHED, AUG      ";:PRINT@451,"INPU
T M TO RETURN TO MENU";:PRINT@22
6," FOR AUGMENTED)";:INPUTG$
3220 IFG$="M"THEN2900
3230 'ALTERS FORMAT TO MATCH C$(
N)
3240 FORX=1TOLEN(G$)
3250 NEXT
3260 IFRIGHT$(G$,3)="MIN"THENG$=
LEFT$(G$,LEN(G$)-4)+"m"
3270 IFRIGHT$(G$,3)="DIM"THENG$=
LEFT$(G$,LEN(G$)-4)+"dim"ELSEIFR
IGHT$(G$,3)="AUG"THENG$=LEFT$(G$
,LEN(G$)-4)+"aug"
3280 FORN=1TO72
3290 IFC$(N)=G$THEN380
3300 NEXT
3310 PRINT@225,"I DON'T KNOW THA
T ONE.       ";:FORDL=1TO1000:NEX
T:GOTO3210
3320 PRINT@422,"RIGHT         WR
ONG";:PRINT@455,SC;:PRINT@469,TT
-SC;:RETURN
3330 'SUBROUTINE FOR DISPLAYING
      SUBSET OF CHORDS
3340 CLS(I-1):KT=(I-3)*12-11
3350 FORN=KT TOKT+11
3360 GOSUB380
3370 NEXT
3380 RETURN
```

## WOMEN & THE COCO
### Conclusion Of A Series

*Whether she leans toward business or education, the computing woman often finds success.*

# The Computing Female

**By Susan P. Davis**

We have spent a lot of time examining the reluctance of women in general to use or experiment with the Color Computer. This month, I would like to discuss some of the exceptions to this generalization.

I have found that most of the women who are using the Color Computer can be divided into two groups: those interested in education and those interested in business.

We find the women who are interested in education heading in several different directions. The most common is the woman who purchases educational software for her own children. They had education in mind when the family purchased the computer, and pursue this goal actively. When women find good educational software and see that their children are benefitting from it, they are likely to bring this observation to the attention of others. Women whose children have been successful with the educational programs have told these "success stories" to their local PTAs. Some have persuaded their schools to purchase the Color Computer and specific educational packages with which they have been pleased.

Teachers have started to bring their own Color Computers to school for the students to use. They realize that exposure to computers should be a critical part of each child's education. The majority of the schools in this country still do not have their own computers, so these teachers are filling an important need. One such teacher, Sharon Bardus, took her CoCo to her third grade classroom and worked with her class. She also uses the CoCo for one-on-one tutoring. This led to the development of several educational programs. Sharon had such success with her programs that she decided to market them. She is now co-owner of B5 Software with her husband Glenn.

Still other women are writing or designing educational programs and marketing them commercially. Many of the companies that advertise in RAINBOW have women owners, managers and programmers.

I have also met and spoken with women who are using the CoCo in businesses they own and operate, as well as women

---

*(Gary and Susan Davis are co-owners of Sugar Software in Reynoldsburg, Ohio. Susan is a novice and Gary has been professionally programming for nearly 20 years.)*

16K
ECB

who use the CoCo provided by their employers. The most common use I have found is word processing.

Three stores in the Central Ohio area are using CoCos for inventory, receipts and other business functions: Reitz Electronics, Cinsoft and the Home Computer Store. The Home Computer Store is owned and operated by two women. They use the CoCo as a cash register keyboard. They enter the item number, price and quantity into the CoCo, and the printer prints out the receipt. It figures and prints the tax and change as well. The inventory is automatically updated, so Sally and Cindy know when they need to restock any item. The program for this was written by a member of the Columbus and Central Ohio CoCo Group.

Of course, we use the CoCo for all of Sugar Software's needs. In addition to product development, we use it to keep track of all of our customers and dealers, maintain our mailing list and write all of our documents. We came across some information on a computer-to-computer typesetting service and decided to give it a try. Our goal was to use our *Telewriter* files (any ASCII file created with a word processing program will work with this program), send them via the modem to Intergraphics, Inc., (106A S. Columbus St., Alexandria, VA 22314) and receive the type back by first class mail a few days later. They have a toll free number (800-368-3342) and a free brochure. The book that we needed in order to use the service was $10. By entering the text and adding the formatting codes yourself, you save quite a bit over having someone else do all the work. The cost is $2 per 1,000 characters with a $5 minimum. Intergraphics has about 190 different typestyles (fonts) in sizes ranging from 4.5 points to 72 points (there are 72 points per inch).

After reading the book, we realized that we couldn't just send our files. The CoCo has no "braces" key and the text editor we were using has no way to enter braces (required by Intergraphics), so we decided to use brackets instead (SHIFT/@ and SHIFT/CLEAR in *Telewriter*). Braces are used in the text to specify the commands to Intergraphics. There are many commands to specify the font, the point size, centering, indenting, etc.

We needed a program to convert brackets to braces for their computer. Also, the typesetter ignores carriage returns, so we needed to convert most of the carriage returns to spaces (there are some exceptions). We also needed a way to send the files. Gary developed our *Typeset* program to accomplish those objectives.

This program can also be used for transmitting ASCII files to other computers and even for uploading programs to computer bulletin board systems. These uses generally require carriage returns so you will have to remove the semicolon at the end of statement 660.

The program is so easy to use that it helped convince Janice Rodenfels of Teddy, Ink. (who does all of our ads and artwork) to purchase a Color Computer, a word processing program and modem. Now, she sets type for all of her customers this way.

Below are some examples of different type styles and type sizes that we have been using.

---

*Fairy Tales*

**Current Events**

***Adventure and Science Fiction***

**SS-002 Sing Along**

***SS-007 Potpourri***

***SS-003 X-Rated***

---

To use the program, you first have to create your text file inserting the necessary formatting commands. At the beginning of the file, you will have to add a command that identifies your file so that Intergraphics will know where and how to mail it.

Turn on your computer and modem. Insert the tape or disk and type *RUN"TYPESET"*. First, enter the input device (tape or disk) and then enter the filename (the name of the ASCII file that you want to typeset) and press ENTER. You will then see a menu of things to do. You can display your file to the screen, print the file, transmit the file to Intergraphics or verify your file for matching braces.

When the file is displayed to the screen, you will see an orange marker for each carriage return that has been replaced with a space.

When the file is printed, each line will be listed along with the number of characters printed so far. This will help you estimate your typesetting charge.

Before you transmit your file, use the verify function to scan your text file for unpaired braces. If any are found, the line is displayed to help you locate and correct it with your editor.

When the file is to be transmitted, you are given a chance to dial up the Intergraphics computer (available 24 hours a day). Their computer never transmits anything, it only receives. When the modems "connect," you hit ENTER to start transmission. Your file will be transmitted to Intergraphics. You should receive your type back in two or three days. If you have a Hayes SmartModem, you can have the modem dial for you. Edit line 730 to remove the *REM* command.

| | |
|---|---|
| 230...... | 105 |
| 490....... | 78 |
| 680...... | 105 |
| END .... | 234 |

**The listing:**

```
10 'TYPESET-MODEM FILE TRANSFER
20 '
30 ' WRITTEN BY GARY A. DAVIS
40 'COPR. 1984, SUGAR SOFTWARE
50 '      2153 LEAH LANE
60 ' REYNOLDSBURG, OHIO 43068
70 '        (614) 861-0565
80 '
90 CLS3
100 PRINT @3,"SUGAR SOFTWARE TYP
SETTER";
110 PRINT @64,"TRANSMIT TEXT FIL
E TO           INTERGRAPHICS, IN
C. PERSONAL     PUBLISHING. PHONE
 1-800-368-3342(VOICE) FOR ARRAN
GEMENTS."
120 CLEAR 1000
130 PB=PEEK(149)*256+PEEK(150) '
 Printer baud rate
140 BO$=CHR$(123) ' Open Brace
150 BC$=CHR$(125) ' Close Brace
160 QL$=BO$+"ql"+BC$
170 QR$=BO$+"qr"+BC$
180 QC$=BO$+"qc"+BC$
190 RR$=BO$+"rr"+BC$
200 W=65314:X=W+1
210 PRINT @224,"";
220 INPUT "DISK OR TAPE INPUT";D
V$
230 DV$=LEFT$(DV$,1)
240 IF DV$="T" THEN DV=-1 ELSE I
F DV$="D" THEN DV=1 ELSE GOTO 22
0
250 PRINT "ENTER FILENAME: ";: L
INE INPUT A$
260 IF DV=1 AND A$="" GOTO 250
270 OPEN "I",#DV,A$
280 CT=0
290 PRINT
300 PRINT"s     OUTPUT TO SCREEN"
310 PRINT"p     OUTPUT TO PRINTER"
320 PRINT"m     OUTPUT TO MODEM"
330 PRINT"v     VALIDATE MATCHING
BRACES"
340 PRINT"x     EXIT TO BASIC"
350 GOSUB 790 ' Set for printer
360 SP$=CHR$(254)
370 INPUT P$
380 IF P$="X" THEN 700
390 IF P$="M" THEN GOSUB 720
400 S$=""
410 LINE INPUT #DV,S$
420 IF EOF(DV) GOTO 700
430 IF S$="" GOTO 680
440 A=INSTR(S$,"["):IF A>0 THEN
MID$(S$,A)=BO$:GOTO 440
450 A=INSTR(S$,"]"):IF A>0 THEN
MID$(S$,A)=BC$:GOTO 450
460 IF P$<>"V" GOTO 610
470 ' Validate matching braces
480 K=INSTR(S$,BO$):L=INSTR(S$,B
C$)
490 IF K+L=0 GOTO 680
500 IF K>L OR K=0 OR L=0 GOTO 58
0
510 C=0
520 FOR K=K TO LEN(S$)
530 Y$=MID$(S$,K,1)
540 IF Y$=BO$ THEN C=NOT C:IF C=
0 GOTO 580
550 IF Y$=BC$ THEN C=NOT C:IF C=
```

• RADIO SHACK™ COLOR COMPUTER

ADVANCED MATH PROGRAMS
for
ENGINEERS • PHYSICISTS • STUDENTS

FUNCTION GRAPHING MODULE 16K EXT-$19.95

- HIGH RESOLUTION GRAPHS
- GRAPH ANY FUNCTION — 4 AT ONCE
- PARAMETERS EASY TO CHANGE
- AUTO-SCALING OPTIMIZES GRAPH SIZE
- COMPUTE FUNCTION VALUES & ZEROS
- INTERSECTION OF FUNCTIONS
- COMPLETE MANUAL — PROGRAM ON TAPE

CALCULUS MATH MODULE 32K EXT-$37.95

- INCLUDES THE GRAPHING MODULE ABOVE
- LOAD UP 9 FUNCTIONS AT ONCE
- FIND AND COMPUTE MAXIMA & MINIMA
- NUMERIC INTEGRATION & DIFFERENTIATION
- COMPOSITE AREAS
- HANDLES PIECEWISE CONTINUOUS FUNCTIONS
- HARD COPIES OF DATA AND/OR GRAPH
- COMPLETE MANUAL — ON TAPE OR DISK

RAINBOW CERTIFICATION SEAL

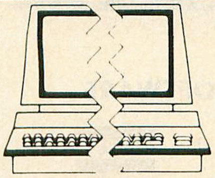
CALCSOFT
P.O. BOX 401
ST. ANN, MO 63074

RAINBOW CERTIFICATION SEAL

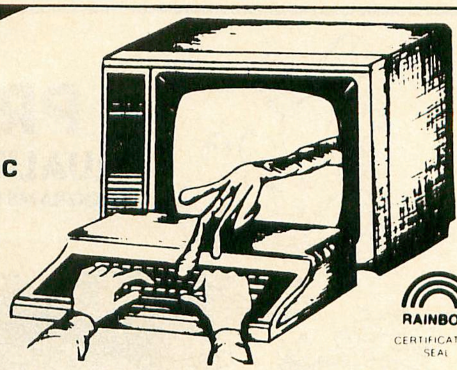
SEND CHECK OR MONEY ORDER
Add $2.00 for shipping

```
-1 GOTO 580
560 NEXT K
570 IF C=0 GOTO 680
580 SOUND100,1:PRINTS$
590 GOTO 680
600 ' Prepare to output to modem
/printer/screen
610 EN$=RIGHT$("    "+S$,4)
620 IF EN$<>QL$ AND EN$<>QR$ AND
 EN$<>QC$ AND EN$<>RR$ AND RIGHT
$(EN$,1)<>" " THEN S$=S$+SP$
630 CT=CT+LEN(S$)
640 PRINTCT;TAB(6);S$
650 IF P$="P" THEN PRINT#-2,CT;T
AB(6);S$
660 IF P$="M" THEN PRINT#-2,S$;
670 S$=""
680 IF INKEY$="S" GOTO 300 ' Sto
p
690 GOTO410
700 CLOSE:SOUND 100,3:PRINT "DON
E":END
710 ' Prepare to transmit file
720 GOSUB 820 ' Set for modem
730 REM PRINT #-2,"AT E0M2TQ1S11
=50D 1-(800) 368-3493" ' Hayes S
mart Modem
740 PRINT "NOW DIAL INTERGRAPHIC
S          1-(800) 368-3493"
750 INPUT"HIT enter WHEN READY T
O TRANSMIT";A$
760 SP$=" "
770 RETURN
780 ' Set serial port for printe
r
790 POKE 149,PB/256:POKE 150,PB
AND 255:POKE X,48:POKE W,248:POK
E X,52:POKE W,0
800 RETURN
810 ' Set serial port for modem
820 POKE 149,0:POKE 150,180:POKE
 X,48:POKE W,249:POKE X,52:POKE
W,0
830 RETURN
```

FLORIDA
SEARCH NO LONGER!
The Software Connection of
Fort Lauderdale is your one stop source
for your Color Computer Software,
Peripherals, Books, Magazines & Repairs



THE SOFTWARE
CONNECTION, INC.
5460 No. State Rd. 7, Suite 108
Fort Lauderdale, FLORIDA 33319
(305) 484-7547



NEW
E.T.T.
ELECTRONIC
TYPING
TEACHER
by
CHERRYSoft

RAINBOW CERTIFICATION SEAL

Learning to type the right way can save you hours of tedious work when entering programs into your CoCo, and this is just what ETT was designed to do. Devote a little time every day practicing with ETT and before you know it you will be typing with confidence. Entering those programs will no longer be the chore it used to be.

ETT's video keyboard lets you practice with all the keys labeled, all the keys blank or only the "home" keys labeled. The visual cues guide you while you learn to type without watching your fingers. ETT shows your accuracy, response time, and words per minute. You will quickly see that you are improving with practice.

With the sentences provided by ETT learning to type can be fun. Over 1000 variations chosen because they include every letter in the alphabet. You can also create your own practice sets. This outstanding program was written by a certified teacher and professional programmer and comes with a ten page student manual-study guide. Requires 16K Extended Basic.

Cassette $21.95

ETT NOW AVAILABLE FOR COMMODORE 64
CASSETTE $24.95 DISK $29.95

NEW
MASTER
CONTROL II

The best doesn't always cost more and MASTER CONTROL II is a good example. What would you be willing to pay for a program that would cut your typing time by more than 50% and eliminate hours of debugging because you misspelled a command word? For example the command STRING$ (requires nine strokes) with MASTER CONTROL II you only require two strokes, just hit the down arrow key twice and it's done, and no mistakes. That is just one of the 50 pre-programmed commands available to you. If that isn't enough you also have the ability to customize your own key to enter a statement or command correctly, automatically every time. But that's not all, how about automatic line numbering. Just enter the starting number and the increment you want and MASTER CONTROL II will do it for you. You also have direct control of MOTOR, AUDIO and TRACE plus a direct RUN key. Sounds great? Well, thousands of color computer owners have been enjoying these features for years. But now the new MASTER CONTROL II also has the following features:

✲New plastic overlay that can be removed when you are not using MASTER CONTROL II.
✲New documentation, to help you get the most from the program.
✲New repeating keyboard.

Cassette $21.95

Include $2.50 Shipping and Handling in U.S.-$5.00 Foreign

CoCo Warehouse
Where Shopping By Mail is "USER FRIENDLY"
500 N. DOBSON - WESTLAND, MI 48185
Phone (313) 722-7957

FREE
CATALOG
•
DEALER
INQUIRIES
INVITED

# PRICKLY-PEAR SOFTWARE

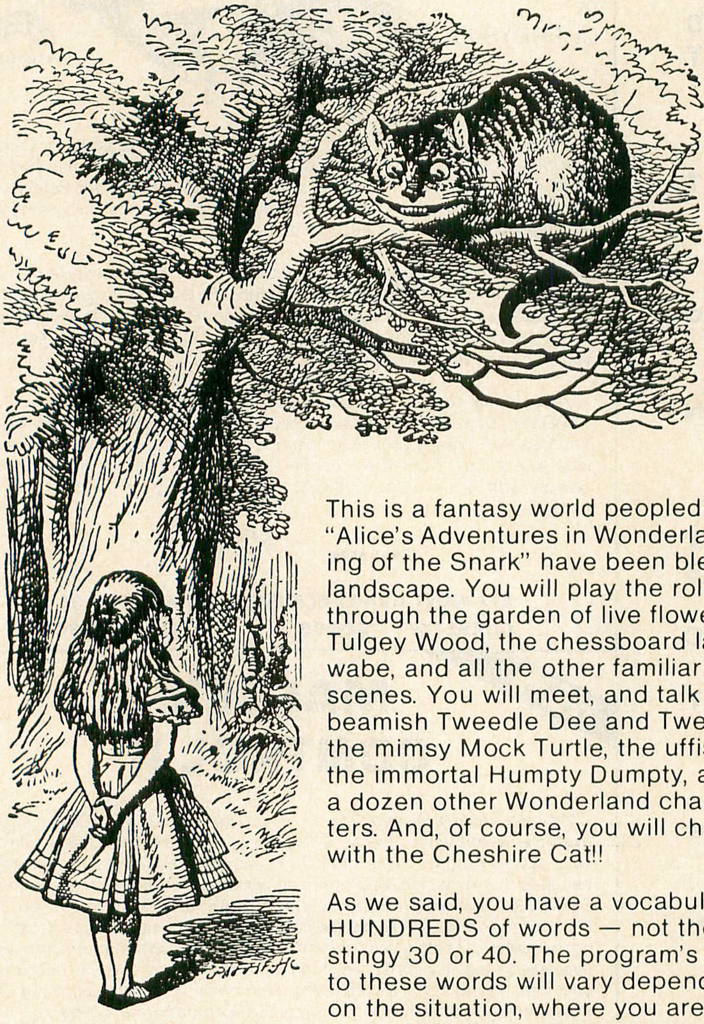
## QUALITY PROGRAMS FOR YOUR COCO & TDP-100

**PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.**

## GREAT NEW ADVENTURE

## ADVENTURE IN WONDERLAND

### 100% MACHINE LANGUAGE



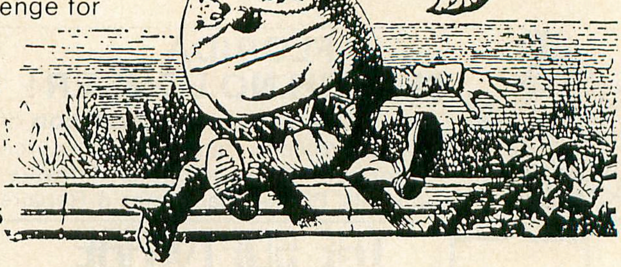
We are going to go out on a limb here. We believe very strongly that this is the BEST adventure game ever written for the color computer. That's right, we said the BEST — no exceptions!!

Adventure in Wonderland is 100% machine language, and completely fills a 32K machine. The program has a vocabulary of literally HUNDREDS of words, and uses a full "ELIZA" type of intelligence simulator. That means you can give commands and conduct conversations in WHOLE SENTENCES if you like!! Try that with any other adventure!

This is a fantasy world peopled with the creatures of Lewis Carroll's imagination. "Alice's Adventures in Wonderland", "Through the Looking Glass", and "The Hunting of the Snark" have been blended into a delightful landscape. You will play the role of Alice as you wander through the garden of live flowers, the treacherous Tulgey Wood, the chessboard landscape, the wabe, and all the other familiar Wonderland scenes. You will meet, and talk with, the beamish Tweedle Dee and Tweedle Dum, the mimsy Mock Turtle, the uffish Duchess, the immortal Humpty Dumpty, and a dozen other Wonderland characters. And, of course, you will chit-chat with the Cheshire Cat!!

As we said, you have a vocabulary of HUNDREDS of words — not the usual stingy 30 or 40. The program's response to these words will vary depending on the situation, where you are, who you are talking with, what you have said in the past, and the way in which the words are combined. Your task is to become Queen, save Wonderland from the Snark, and manage to return home. You may feel completely trapped in certain places in Wonderland, but there is always a way out . . . in fact, there are always (at least) three exits from each trap. An open mind, a pure heart, and a touch of Wonderland madness will keep you from despair!!

This is not an easy adventure, and will provide ample challenge for the most experienced adult players, but you will have so much fun conversing with the denisons of Wonderland that you may not want to leave anyway. We want to repeat what we said above, because we really mean it. WE BELIEVE THIS TO BE THE VERY BEST ADVENTURE EVER WRITTEN FOR THE COLOR COMPUTER. After you have tried it, you'll think so too! 100% machine language — Fully 32K long. **Tape - $24.95; Disk - $29.95**



Programs are available on AMDEK cartridges - add $5.00 to the disk price.

Your personal check is welcome - no delay. Include $1.50 shipping for each program ordered. (Shipping free on $50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

**Stocked by Quality Dealers, or**

Send Order To: **PRICKLY-PEAR SOFTWARE**
8532 E. 24th Street
Tucson, Arizona 85710
(602) 886-1505

MasterCard VISA

*Finish your symphony with . . .*

# *The Computer Chord Finder*

### *By Robert Rogers*

*The Computer Chord Finder* was written to simplify the process of consulting a confusing chord chart to find the notes in a chord. While I play the organ professionally, I still need to find a chord sometimes. A beginner on either the organ or piano will find it invaluable. Those playing the guitar could use part of this program as a basis for their chords. *The Computer Chord Finder* can be used with any music (sheet, easy-play, chord organ) that includes chord symbols above the melody line. Even music with guitar chords could be used.

Upon *RUNning* the program, a title card will appear while the program reads *DATA* and draws the graphics (you could adapt the title card to your own initials in your own programs). You then will be given a choice of high or low speed. If your computer can handle the *POKE 65495,0* then answer with 'H'. I recommend that disk users choose the low speed.

Now you are ready. You will be asked what chord you want defined. The program knows all the chords listed after these instructions. The form in which they are entered is shown to the left, and is consistent with the chord symbols on most musical pieces. The notes of the chord will then be printed in the most accepted inversion. In most cases, C will be middle C. Then the chord will be played arpeggio style, giving you an example of what it sounds like. Non-players will enjoy learning a little about chords, too. Then you are asked whether you want a keyboard display. If you answer "yes" then a keyboard will be displayed in Hi-Res and marks will show which to play in the correct inversion. The chord will be played again; then just hit any key to continue.

| | | | |
|---|---|---|---|
| **Major** | C | F# | E*b* |
| **Minor** | CM | F#M | E*b*M |
| **Seventh** | C7 | F#7 | E*b*7 |
| **Diminished** | CDIM | F#DIM | E*b*DIM |
| **Major Seventh** | CMAJ7 | F#MAJ7 | E*b*MAJ7 |
| **Minor Seventh** | CM7 | F#M7 | E*b*M7 |
| **Augmented** | C+ | F#+ | E*b*+ |
| **Sixth** | C6 | F#6 | E*b*6 |
| **Ninth** | C9 | F#9 | E*b*9 |
| **Minor Sixth** | CM6 | F#M6 | E*b*M6 |
| | **Natural** | **Sharp** | **Flat** |

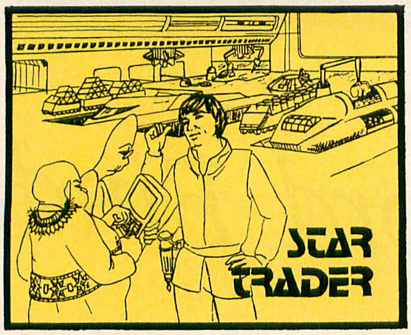
Certain chords with enharmonics (two names such as F# and G*b*) will be converted to just one no matter which you type in. Generally most sharps will be turned to flats. For those who have any brand of 80-column printer, I have included a print-out provision. Just type 'L' in response to "what chord . . ." and a chord chart will be printed. If you type in an undefined chord, you will hear Beethoven's "Fifth." I hope other CoCo musicians will find this program as useful as I have. Good luck.

**Note:** The chords' notes and key positions are contained in the *DATA* statements in lines 120-175 (K$) and decoded to letters (S$) in lines 1001-1002 and graphics locations in lines 1500-1600. Unfortunately, these codes are hard to modify without studying the

---

*(Robert Rogers is a junior at Forest Hill High School in West Palm Beach, Fla., who has been a self-taught programmer for two years. His interests include performing professionally on the organ and model railroading.)*

# Computerware® — Leader in Quality Games



**STAR TRADER** is a graphics adventure game you can play again and again! You assume the role of a merchant ship captain in the far future. You travel between solar systems, trading cargo, encountering pirate ships, stopping at starports for news or fuel or repairs, and making money! Your goal is to collect 1,000 credits so you can retire in luxury from the fast-paced, even dangerous world of solar merchants.

Your cockpit is shown on the graphics screen with gauges and read-outs to tell you: your location, current damage status, your credit balance, cargo destination and due date, the location of any nearby starships, fuel and laser power levels, and the current date.

While traveling you JUMP through hyperspace; THRUST within a solar system; use CARGO for picking up, delivering, illegally selling or dumping cargo; go to STARPORT where you buy fuel and repairs; BATTLE with nearby starships; or pick up unrefined fuel at GAS GIANTS. As you travel and battle you develop a reputation which will effect your future activities.

With different skill levels and many variable factors, STAR TRADER offers the excitement and challenge of a new game every time you play! (Requires 32K on cassette or 64K on disk, with one joystick or mouse.)

**Cassette $24.95 Disk $27.95**

**Graphics Adventure**

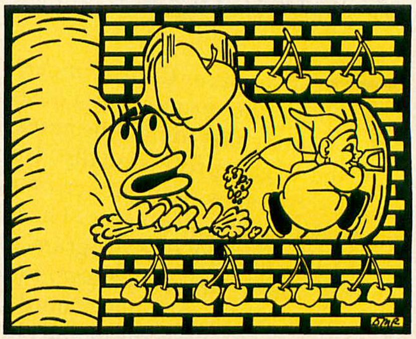
**MR DIG**

**Arcade Graphics**

Cherry pickin', tunnel diggin', bad-guy chasin', fast moving fun—DO it all with MR. DIGG!!! Help this little wizard harvest his cherry crop by guiding him through the orchard and away from the bad hunters. If they get too close, squish them with a falling apple or bounce your magic orb their way. If you capture the extra treats you get extra points—and extra chompers that chase Mr. Dig! Don't forget the bad Lettermen. If you eliminate all five of them you get an extra Mr. Dig! When all the DIGGIN's been DUG, go on to a new screen full of challenges!

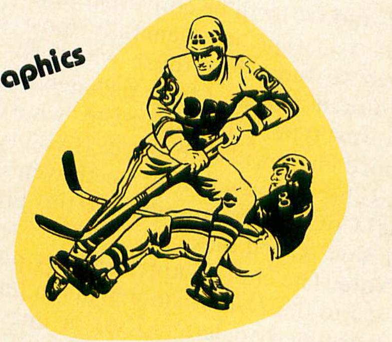
All the fun is in detailed hi-res color graphics and is accompanied by music! Everyone who plays Mr. Dig falls in love with this cute little fella—and his game!! (Requires 32K of memory and a joystick.)

**Cassette $27.95 Disk $30.95**



**Athletics**

**Action Graphics**

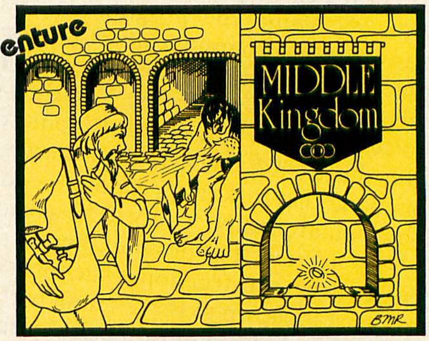


**ICE HOCKEY**

This exciting replica of real athletics begins with the mellow tones of our national anthem. Then you race into action in hi-res color graphics with realistic player and puck movement. One or two players compete against the real time clock just like in the NHL! Many skill levels provide challenge for everyone! (Requires 32K of memory and one or two joysticks.)

**Cassette $24.95 Disk $27.95**

**Graphics Adventure**



**MIDDLE KINGDOM**

In this real time graphics adventure set in Medieval times, your goal is to become ruler of the Middle Kingdom, which can be achieved only by returning the three Magic Rings to the Sanctuary. You must search the rooms of the Catacombs, Temple, & Pyramid. Be warned! Trolls, monsters, and dangers luck in these rooms! (Requires 32K).

**Cassette $24.95 Disk $27.95**

Dealer Inquiries Invited

# Computerware®

Box 668 • Encinitas, CA 92024
(619) 436-3512
Add shipping of $2 or $5 Air/Canada
Visa & MasterCard Accepted

Computer is a federally registered trademark of Computerware.

key position data in line 99. This was done to save having two sets of data. I don't think any changes will have to be made, but if you do want to make some, note that the graphic display will provide the key to understanding the note-numbering system.

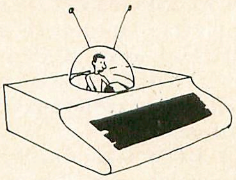
| | |
|---|---|
| 57 ........ | 55 |
| 135 ...... | 221 |
| 370 ....... | 16 |
| 1030 .... | 206 |
| 5000 .... | 127 |
| END .... | 124 |

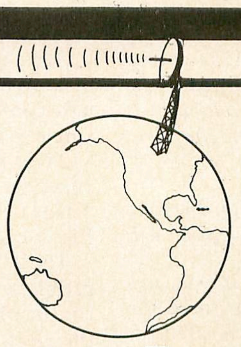
**The listing:**

```
0 'COPYRIGHT (C) 1983 BY ROBERT
 T. ROGERS
1 PCLEAR4:CLEAR500
10 CLS0:PRINT@96,STRING$(32,159)
;:PRINT@128,STRING$(32,175);"---
 COMPUTERIZED CHORD FINDER---";:
PRINTSTRING$(32,175);:PRINT@224,
STRING$(32,159);
20 PRINT@288," BY ROBERT T. ROGE
RS  (C) 1983
30 PRINT@352,"  FOR 16K EXTENDED
 BASIC COCOS
31 PRINT@416," NOT INTENDED FOR
REPRODUCTION! ";
40 PRINT@485,"VERSION 2.0 JUNE 1
983";
51 S=8
52 V=175
53 L=1
54 FORX=0TO9:SOUNDV,L:SET(X,3,S)
:NEXTX
55 FORY=3TO0STEP-1:SOUNDV,L:SET(
9,Y,S):NEXTY
56 FORX=9TO13:SOUNDV,L:SET(X,0,S
):NEXTX
57 SET(13,1,S):SOUNDV,L:SET(12,2
,S):SOUNDV,L
58 FORX=13TO17:SOUNDV,L:SET(X,3,
S):NEXTX
59 FORY=3TO0STEP-1:SOUNDV,L:SET(
17,Y,S):NEXTY
60 FORX=17TO15STEP-1:SOUNDV,L:SE
T(X,0,S):NEXTX
61 FORY=3TO0STEP-1:SOUNDV,L:SET(
19,Y,S):NEXTY
62 FORX=19TO23:SOUNDV,L:SET(X,0,
S):NEXTX
63 SET(23,1,S):SOUNDV,L:SET(22,2
,S):SOUNDV,L
64 FORX=23TO63:SOUNDV,L:SET(X,3,
S)
65 NEXTX
90 PLAY"L5"
99 DIML(30),LL(15):FORX=8TO256ST
EP14:T=T+1:L(T)=X:NEXTX:T=0:FORX
=11TO239STEP14:IFX=39 OR X=95 OR
 X=137 OR X=193 OR X=235 THEN100
:ELSE Q=(X+X+7)/2:T=T+1:LL(T)=Q
100 NEXTX
110 DIMK$(120): FORT=1TO120:READ
K$(T):NEXTT
111 DIMN$(120):DIMS$(30): FOR X=
1TO120 :READ N$(X):NEXTX
120 DATA050810,050825,05230810,2
1060825,01030507,05230825,220810
,05060810,05230910,05060825
125 DATA050709,052309,05070911,0
5232410,05070926,05230911,050725
,05070910,06070911,05230910
130 DATA210609,060911,21060809,2
2070911,02210624,06080911,212309
,21060709,21060810,06070911
135 DATA062410,060810,05062410,2
1060825,06241027,05060810,062411
,21062410,05072410,21060810
140 DATA220710,050710,22070910,0
5232410,03220725,05070910,220810
,22072410,21220709,07241012
145 DATA210725,210709,21060725,0
4220709,07252628,21060709,050725
,21220725,21062425,21220709
150 DATA060811,220811,06082511,0
4220709,04060810,22082511,062411
,06080911,05060825,08091127
155 DATA212324,210624,21232410,2
1060825,21232411,21062410,212309
,21232425,22232411,06242526
160 DATA222411,222410,22072411,0
5232410,19042208,22072410,062411
,22232411,22072511,22232410
165 DATA220825,220725,21220825,0
4220709,22082512,21220725,220810
,22082511,21230825,04220725
170 DATA052325,212325,05232425,2
1060825,20052309,21232425,050725
,05230825,05232411,23082526
175 DATA230911,232411,04222309,0
5232410,23091113,22232411,212309
,05230911,04220809,23241112
370 FOR X=1TO30 :READ S$(X):NEXT
X
371 GOSUB30000:CLS:PRINT:PRINT"
DO YOU WANT <H>IGH OR <L>OW
SPEED FOR PROGRAM OPERATION?"
380 A$=INKEY$:IFA$=""THEN380
390 IFA$="H"THEN POKE65495,0ELSE
POKE65494,0
395 CLS3
400 PRINT:PRINTSTRING$(32,"-"):I
NPUT" WHAT CHORD DO YOU WANT";B$
:C$=B$
401 IFB$="L"THEN10000
402 IFB$=""THENCLSRND(8):FORT=25
5TO1STEP-12:SOUNDT,1:NEXTT:GOTO4
```

```
00
405 CLSRND(8)
410 FORX=1TO120: IF B$=N$(X)THEN
1000:NEXTX
415 NEXTX
416 IF F=1THEN420ELSEF=1:GOSUB30
00:GOTO410
420 F=0:CLS0:PRINT:PRINT"
 NO SUCH CHORD":PRINT:FORY=1TO3
:SOUND147,4:NEXTY:SOUND117,12:FO
RY=1TO3:SOUND133,4:NEXT:SOUND108
,12:PRINT:GOTO400
1000 F=0:PRINT:PRINT" THE CHORD
 "C$" CONSISTS":PRINT" OF THESE
 NOTES----";
1001 CH$="":W=LEN(K$(X)):FORT=1T
OW STEP2:W$=MID$(K$(X),T,2):WW=V
AL(W$)
1002 CH$=CH$+" "+S$(WW):NEXTT
1003 PRINTCH$
1004 PLAY"T50"
1005 FORT=1TO20
1020 PLAY CH$
1025 NEXTT
1030 PRINT:LINEINPUT" WANT A KEY
BOARD DISPLAY? ";Q$:IFLEFT$(Q$,1
)="Y"THEN1500ELSEGOTO400
1500 PMODE0,1:SCREEN1,1:FORZ=1TO
W STEP2:P$=MID$(K$(X),Z,2):P=VAL
(P$):GOTO1600
1505 NEXTZ
1510 FORT=1TO30:PLAYCH$:NEXTT
1520 IFINKEY$=""THEN1520ELSECLSR
ND(8):SCREEN0,1:GOSUB30000:GOTO4
00
1600 IFP=>19THENP=(P-19)+1:CIRCL
E(LL(P),70),3,5:GOTO1505
1610 CIRCLE(L(P),138),3,0:GOTO15
05
3000 IFLEFT$(B$,2)="G#" THEN MID
$(B$,1,2)="A-":RETURN
3010 IFLEFT$(B$,2)="G-" THEN MID
$(B$,1,2)="F#":RETURN
3020 IFLEFT$(B$,2)="A#" THEN MID
$(B$,1,2)="B-":RETURN
3030 IFLEFT$(B$,2)="C#" THEN MID
$(B$,1,2)="D-":RETURN
3040 IFLEFT$(B$,2)="D#" THEN MID
$(B$,1,2)="E-":RETURN
3050 IFLEFT$(B$,2)="C-" THEN T$=
RIGHT$(B$,LEN(B$)-2):B$="B"+T$:R
ETURN
3060 IFLEFT$(B$,2)="B+"THENT$=RI
GHT$(B$,LEN(B$)-2):B$="C"+T$:RET
URN
3070 IFLEFT$(B$,2)="E+"THENT$=RI
GHT$(B$,LEN(B$)-2):B$="F"+T$:RET
URN
3080 IFLEFT$(B$,2)="F-"THENT$=RI
GHT$(B$,LEN(B$)-2):B$="E"+T$:RET
URN
3999 RETURN
5000 DATAC,CM,C7,CDIM,CMAJ7,CM7,
C+,C6,C9,CM6
5010 DATAG,GM,G7,GDIM,GMAJ7,GM7,
G+,G6,G9,GM6
5020 DATAD,DM,D7,DDIM,DMAJ7,DM7,
D+,D6,D9,DM6
5030 DATAA,AM,A7,ADIM,AMAJ7,AM7,
A+,A6,A9,AM6
5040 DATAE,EM,E7,EDIM,EMAJ7,EM7,
E+,E6,E9,EM6
5050 DATAB,BM,B7,BDIM,BMAJ7,BM7,
B+,B6,B9,BM6
5060 DATAF,FM,F7,FDIM,FMAJ7,FM7,
F+,F6,F9,FM6
5070 DATAF#,F#M,F#7,F#DIM,F#MAJ7
,F#M7,F#+,F#6,F#9,F#M6
5090 DATAD-,D-M,D-7,D-DIM,D-MAJ7
,D-M7,D-+,D-6,D-9,D-M6
6000 DATAA-,A-M,A-7,A-DIM,A-MAJ7
,A-M7,A-+,A-6,A-9,A-M6
6010 DATAE-,E-M,E-7,E-DIM,E-MAJ7
,E-M7,E-+,E-6,E-9,E-M6
6020 DATAB-,B-M,B-7,B-DIM,B-MAJ7
,B-M7,B-+,B-6,B-9,B-M6
8000 DATAC,D,E,F,G,A,B,C,D,E,F,G
,A,B,C,D,E,F,D-,E-,G-,A-,B-,D-,E
-,F#,G#,A#,D-,E-
10000 CLS:PRINT@224,"";:LINEINPU
T" <ENTER> WHEN PRINTER READY";R
$
10002 IFR$="X"THEN400
10005 PRINT#-2,"SYMBOL","CHORD N
OTES","SYMBOL","CHORD NOTES":PRI
NT#-2,STRING$(80,"-"):PRINT#-2
10010 FORX=1TO60:XX=X:F=1
10011 W=LEN(K$(XX)):FORZ=1TOW ST
EP2:W$=MID$(K$(XX),Z,2):WW=VAL(W
$)
10012 CH$(F)=CH$(F)+" "+S$(WW):N
EXTZ:IFF=2THEN10014:ELSEXX=X+60:
F=2:GOTO10011
10014 PRINT#-2,N$(X),CH$(1),N$(X
+54),CH$(2):CH$(1)="":CH$(2)="":
NEXTX
10015 PRINT#-2:PRINT#-2,STRING$(
80,"=")
10020 CLS:GOTO400
30000 PMODE0,1:COLOR0,5:PCLS5:LI
NE(0,40)-(256,160),PSET,B
30010 FORX=1TO242STEP14:LINE(X,4
0)-(X,160),PSET:NEXT
30020 FORX=11TO239STEP14:IFX=39
OR X=95 OR X=137 OR X=193 OR X=2
35 THEN30025:ELSELINE(X,40)-(X+7
,110),PSET,BF
30025 NEXTX:RETURN
```

**EARTH TO ED**





# Introducing A New Department Featuring Letters From *Earth To Ed*

**By Ed Ellers**
**RAINBOW Technical Writer**

### CoCo Across The Seas

• *I now find myself faced with a move to the Netherlands, land of 220-volt/50-hertz AC power, and I'm getting conflicting information on being able to use my American-made CoCo in Europe.*

*What, if anything, can be done to make the CoCo compatible with 220-V/50-Hz current? Where can I have the modification accomplished? If it can't be modified, will the programs I have (tape, ROM pack) work with a European CoCo?*

*Charles A. Marcotte*
*Sunnymeade, CA*

Radio Shack's National Parts Department carries the 220-volt/50-hertz transformer for the CoCo, which replaces the 120-volt transformer on your computer. A step-down transformer like the ones used for radios and appliances would be unsuitable because the CoCo's transformer is made for 60 Hz AC; 50 Hz requires a larger transformer to carry the same power. You will also need a new AC line plug to fit European outlets.

This is only half of the problem; since European TV standards are different from ours, your U.S. CoCo will not feed the correct signals to a European TV set. If you don't want to take an American TV with you (and deal with its power needs as well), you will have to modify the CoCo for European TV standards (PAL color encoding instead of NTSC, 625 lines and 50 fields per second and different channel frequencies). Radio Shack's service centers will perform both of these modifications for you. (Some TV sets sold in Europe are now available with triple-standard capability; you might want to look into it.)

As for the software you already have, any CoCo program will run on either American or European CoCos without modification.

---

*(Ed Ellers, a* RAINBOW *and* PCM *staff member, is a self-confessed electronics fanatic whose other interests include science fiction.)*

### The Truth About 64K Upgrades

• *I recently had my 16K computer upgraded to 64K. At that time, I was told I needed Extended Color* BASIC*. Now I find I didn't. I was also told that I could utilize the full 64K with a disk drive. Now I find I need OS-9 to get all 64K. Am I wrong, or are some people finding it hard to be truthful?*

*William J. Ellis*
*Anaheim, CA*

You don't need Extended Color BASIC, a disk drive or OS-9 to use the full 64K; you do need some program that will switch the CoCo into the "all-RAM" mode and copy the BASIC ROMs (or whatever portion is needed) into the upper 32K. Cognitec's *Telewriter-64*, Softlaw's VIP Library programs and a number of other commercial programs make use of the full 64K in their operation, as do OS-9 and FLEX. To use more than 32K in BASIC programs, you can use the "Bigger Byte for BASIC" program on Page 74 of January's RAINBOW.

---

### Changing Colors

• *When I do Low-Res graphics and I* SET *two squares next to each other on the same* PRINT @ *location, the first dot I set turns the same color as the second, unless one of them is black. Is this due to my TV set or the computer, and how can it be solved?*

*John Pinter*
*Palo Alto, CA*

This quirk is due to the way that the CoCo defines colors in the Low-Res (semigraphics 4) mode. Each character location on the screen can display either an alphanumeric character or four blocks (a two by two matrix). When graphic blocks are displayed, the color of each is determined by the color set for that location. Blocks that aren't set are displayed as black. When you set a block in a new color, any other blocks that are set in that location take on the new color. I don't know of any solution other than to plan your plotting locations carefully.

### Same Adventure, Different Computer

• *I used to play Scott Adams' Adventures on a TRS-80 Model I long ago and was wondering if they make Adventures 1 through 10 for the CoCo.*

*Phil Conrod*
*Lakewood, CO*

Adventure International has released Adventures 1 through 12 for the Color Computer. They are played in exactly the same way as the Model I versions. I don't know if the Scott Adams Graphic Adventures (SAGAs) are to be released for the CoCo; the SAGA series has the same Adventures with added graphic pictures of each room.

---

### No Memory Shortage Here

• *I own a Radio Shack DMP-120 printer and their Hi-Res Screen Print Utility program (cat. no. 26-3121). Using the* BWDUMP *program in the package, I got an OM Error in the "Season's Greeting Cards" program by Joseph Kolar (December 1983, Page 98). Can you give me any further suggestions?*

*James R. Rahn*
*Ship Bottom, NJ*

The *BWDUMP* program (for Radio Shack's LP VII, VIII and DMP series printers) and *CODUMP* (for the CGP-220 ink-jet color printer) are designed for a 16K machine; when you do the *CLEAR 200, 14848* specified in the manual you effectively set aside the upper 16K in a 32K machine. To use *BWDUMP* or *CODUMP* in a 32K CoCo, use *CLEAR 200, 31232* and then *CLOADM "program", 16384:EXEC* to load. The programs are fully relocatable and will run fine in the upper 16K.

---

### Doubletime, March!

• *In the review of the Dragonfly Fan (January 1984, Page 264), the author stated that the 6809E CPU chip can be replaced by a 2-MHz 68A09E. Is this correct? I have not*

COLOR
CONNECTION
SOFTWARE
1060 Buddlea Dr., Sandy, Utah 84070 (801) 571-5023
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

MEGAMUNK Joysticks req'd.
A fantastic new Hi-res strategic arcade game with animated movement! As a soldier/monkey of fortune, you have been commissioned by the king to save the forest from its enemies. Fulfill the assignment and be knighted a monkey of the round table.
32k cas $21.95 32k disk $23.95

COLOR DESIGNER
The ultimate Hi-Res Graphics Processor!!! Great for doodling, sketching, and most of all, creating entire graphics screens. Options include: 8 key cursor control with key repeat, Draw command that follows your cursor, FILL command that "PAINTS" the screen with more than 1000 different color/texture combinations, and much much more!!
16/32K cas $26.95 disk $28.95.

QUIZ ALL
A versatile quiz program. Has study and test formats and allows printing of quiz. Even includes an option for the computer to generate multiple choice answers!
cas $18.95 disk $20.95

COMPU SCRIBE B.S.A.
Need some help with scout records? Compu Scribe keeps tabs on the whole troop and creates printouts by scout, by rank, or alphabetically. Requires a printer with 132 character mode.
availabe on disk only - $26.95

OKI DUMP
Eight bit screen dump from CoCo to an Okidata printer without dot addressable graphics! Includes hints on printing pictures of game screens, etc. ("The King", by Tom Mix, is the example) a steal at
16K cas $8.95 16K disk $10.95

Call or write for our free newsletter.

Dog-gone it.
I wish I could play
Megamunk!

All cassette orders include disk version on cassette with instructions to transfer to disk. Unless otherwise specified, programs require 16K extended for csssette or 32K extended for disk. Add $2.00 shipping and handling. Utah residents add 5¾% sales tax. Orders paid by personal check allow 1-2 weeks; all others shipped within 48 hours. No COD.

To order, call 24 hours a day or write
COLOR CONNECTION SOFTWARE
1060 Buddlea Drive, Sandy, Utah 84070
For information:
Call Weekdays between 6:30 pm and 10 pm MST
(801) 571-5023

*seen in any catalog a 2-MHz 68A09E, but a 2-MHz 68B09E. If so, do I need to buy additional parts and/or adjust the clock frequency, or can I just plug in the new microprocessor?*

*Ken Bennett*
*Bridgeport, CT*

Let me clear up this error (it was my review, by the way). The 6809E is rated for operation at 1 MHz. The 68A09E is rated 1.5 MHz, while the 68B09E is a 2-MHz part. The clock speed rating of an IC is not how fast the part *will* run, but how fast it *can* run. The actual speed is determined by the clock signal fed into the chip. When you do a *POKE65495,0*, the SAM chip changes from a .895 MHz clock signal to a 1.79 MHz signal (*POKE65494,0* goes back to normal). If the CPU and other chips are capable of this speed, the CoCo works fine at 1.79 MHz. To go to a higher speed you would have to replace the 3.58-MHz crystal with one for a higher frequency, and this would cause the video signal (the 6847 video chip uses 3.58 MHz as its reference) to run way too fast for your TV.

### Monitoring The CoCo

• *I have an opportunity to buy a Zenith ZVM-135 color monitor for use with my CoCo. However, I do not know what type of special hardware interface or modifications will be necessary to use it.*

*Stuart R. Clink*
*Bedford Heights, OH*

Any "composite" color or monochrome monitor (as well as video recorders and TV/monitor sets) will work with the CoCo using one of several video interface adapters on the market or the project in our May "Turn Of The Screw" column on Page 188. RGB color monitors won't work without a rather complex interface circuit. The Zenith ZVM-133 and 135 have *both* composite and RGB inputs, so an adapter is all you need.

### CoCo 2 Disk Drives

• *I have the old gray version of the CoCo and I recently ordered a disk drive. Tandy is no longer making the gray drives, and I was sent the CoCo 2 drive as they are "supposed to be" compatible.*

*It is presenting some problems. The* F-16 *game would not run until the nice folks at KRT Software gave me a modification. I have been trying to run the* Tape Utility *by Thomas P. Olk and only the title will display.*

*Can you tell me exactly what the differences are between the two disk drives and what I can do to modify the disk drive instead of every program?*

*Donald Burk*
*Green Cave Springs, FL*

The major differences between the present disk system and the older one are that the new controller will work with the CoCo 2's single +5V power supply (the old one needed +12V as well), and the Disk BASIC ROM is version 1.1 instead of 1.0. The drive itself is a Texas Peripherals unit instead of the Tokyo Electric drive used before.

The 1.1 Disk BASIC ROM is causing the problem with your programs, as most of the routines have been moved to make room for the *DOS* command (to boot OS-9 directly). The 1.0 ROM will still work if you can get one; Radio Shack National Parts may not have any more in stock. This change will allow your older disk-based CoCo programs to run normally.

### Oh, Brother!

• *I have a Brother Correctronic 50 typewriter. Using their IF-50 interface, I have not yet been able to get it to work for me. It does work with IBM PC, Apple II, Atari and other computers.*

*Tim Kraetsch*
*Milwaukee, WI*

• *I have connected a Brother Correctronic 50 typewriter through its IF-50 interface to my CoCo. It works fine with the* Scripsit *Program Pak, but not with Disk* Scripsit. *I wrote to Radio Shack Customer Service, but the only written reply was this:*

> *The ROM pack* Scripsit *uses one stop bit, which is acceptable to the Brother typewriter. However, the Disk* Scripsit *does not time out the stop bit; and the Radio Shack printers are designed to accommodate the type of protocol because the printer is looking for a change of state rather than timing the stop bit. The Brother typewriter is timing the stop bit and it is causing it to go out of sync.*

*I hate to give up on this matter.*

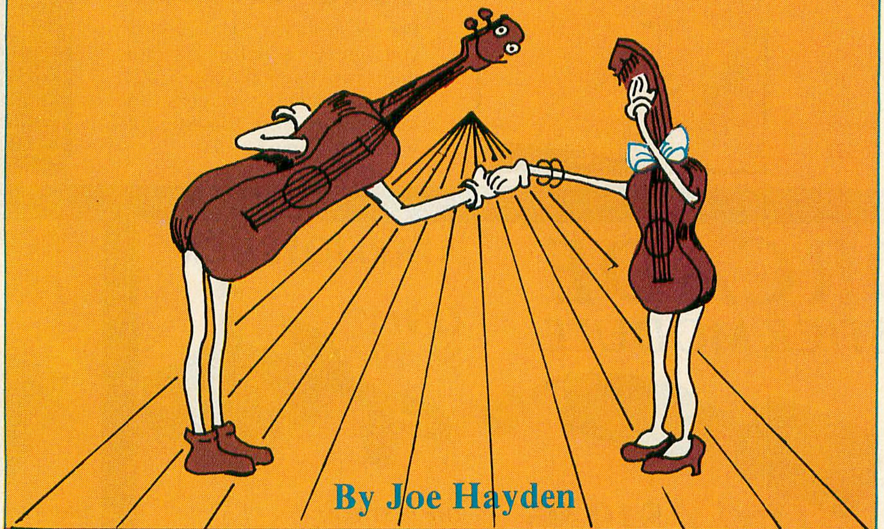
*Ashok Basargekar*
*Orange, CA*

My understanding is that the IF-50 interface module has both an RS-232 serial port (which is what the CoCo uses) and a Centronics-type parallel port. One way to get around the problem that you describe is to use a serial-to-parallel interface, such as the Botek Instruments CCP-1, PBH CoCo Serial Interface or Dayton Associates' Blue Streak. These will connect the CoCo to the Brother's parallel port and permit operation at up to 9600 Baud. As far as I can tell, all three will work with all CoCo software.

**Ed Ellers will try to answer any questions you may have about the CoCo and its applications. Send your questions from *Earth To Ed*, THE RAINBOW, P.O. Box 209, Prospect, KY 40059.**

16K
ECB

# A Little String Music Please



### By Joe Hayden

*Adding sound effects to your programs is easy with this 'sound sampler'*

| | |
|---|---|
| 270 | 81 |
| 420 | 88 |
| 530 | 136 |
| 690 | 93 |
| END | 29 |

Did you ever write a program, get it all ready, *RUN* it, and ask yourself "What's missing?" Could it be sound?

*The Last Sound Off* is music strings I have arranged. The program is mostly self-explanatory. To listen to a tune, simply input a number from one to 46. If you like the last tune you heard and you have a printer, press ENTER without typing a number and the program will ask if you want the string dumped to the printer. If you don't, type 'N', or else type 'Y' and wait. It will now ask you your comment. You can input something like "SOUND EXPLOSION." It will then dump your comment to the printer. To use the strings that are dumped to the printer, type "PLAY (your string)" and ENTER. To end the program, type 'E' when it asks what to do.

This is my most recent copy to date, but if you want a later version send $3 for postage and I will send it on tape.

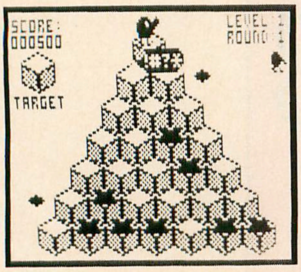
---

*(Joe Hayden is presently a sophomore at James Logan High School in Union City, Calif. He enjoys science fiction, Adventuring and programming.)*

**The listing:**

```
100 'MUSIC AND SOUNDS
110 'VERSION 1.1
120 'BY JOE HAYDEN
130 '    31166 OAKHILL WAY
140 '    HAYWARD CALIF. 94544
150 '
160 CLS:PRINT@102,"music and sou
nds"
170 PRINT"BROUGHT TO YOU BY...":
PRINT
180 PRINTTAB(6)"SHARD SOFTWARE
190 GOSUB300:PLAYP$
200 CLS:PRINT"WHAT WOULD YOU LIK
E TO DO:":PRINT
210 PRINT"YOU MAY ENTER A NUMBER
"
220 PRINTTAB(8)"FROM 1 TO 51":PR
INT
230 PRINT"OR DUMP THE LAST TUNE
TO":PRINTTAB(11)"PRINTER BY"
```

# THE TOP 4 COCO GAMES...

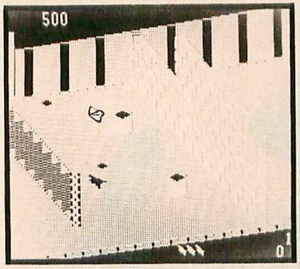


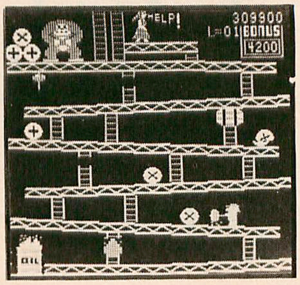
## CUBIX

By Spectral Associates. Very much like the arcade smash! Jump little Cubix around the 3D maze trying to change the color of all the squares. With Death Globes, Discs, Snakes, etc. 32K Tape: $24.95

## ZAKSUND

From Elite Software comes this fantastic arcade style space action game with 3 different stages of moving 3-D graphics. You've never seen anything like this on your CoCo! Great sound too! 32K Tape: $24.95



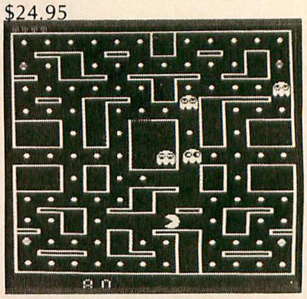


## THE KING

Previously called 'Donkey King', you simply cannot buy a more impressive game for your CoCo. With 4 different screens and loads of fun! From Tom Mix Software. 32K Tape: $25.95

## GHOST GOBBLER

From Spectral Assoc. This "PAC" theme game has been improved several times. It is definitely the best of its type. Brilliant color, action and sound, just like an arcade. 16K Tape: $24.95



# COLORCADE

## SUPER JOYSTICK MODULE

WITH RAPID FIRE!

## ONLY $19.95

***JOYSTICK INTERFACE/RAPID FIRE/6 FT. EXTENDER ALL IN ONE!*** The Colorcade allows connection of any Atari type joystick to your CoCo (including the Wico Red Ball). These switch type sticks are extremely rugged and have a faster and more positive response. They will improve the play of almost any action game.

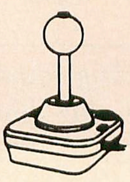
An adjustable speed rapid fire circuit is built in. Press your fire button and get a great burst of fire instead of just a single shot! You get a real advantage in shooting games that do not have repeat fire.

## ATARI JOYSTICK

*ONLY $8.50*

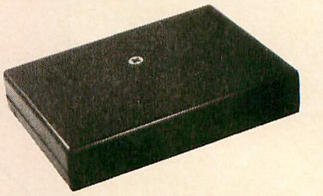
*THE BEST YOU CAN BUY*
*WICO #15-9730*

*~~$34.95~~*
*$29.95*



## WICO FAMOUS "RED BALL"

## ROM/ PROJECT/ PRODUCT CASE

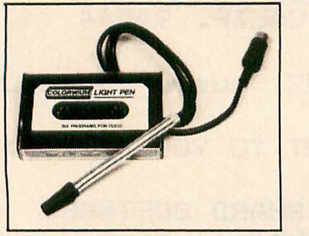


***Give a professional look to your project or product!*** High quality 3 piece injection molded plastic with spring loaded door. Designed especially for the CoCo ROM slot.

| | |
|---|---|
| 2 - 4 pcs. | $5.50 Ea. |
| 5 - 9 pcs. | $3.50 Ea. |
| 10 - 99 pcs. | $2.75 Ea. |
| 100 & UP | Call Us |

P.C. board for 27XX EPROMS. . . $4.00 Ea.

# COLORWARE LIGHT PEN

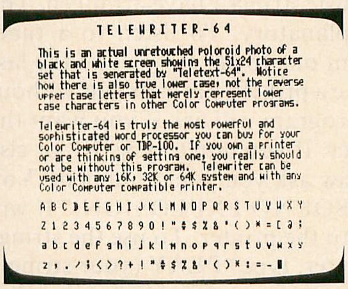


## ONLY $19.95

## WITH SIX FREE PROGRAMS ON CASSETTE!

The Colorware Light Pen plugs directly into your joystick port and comes with six fun & useful programs on cassette. Easy instructions show how to use it with Basic and it's compatible with light pen software such as Computer Island's "Fun Pack." Order yours today. Only $19.95 complete.

# TELEWRITER-64



```
TELEWRITER-64

This is an actual unretouched poloroid photo of a
black and white screen showing the 51x24 character
set that is generated by "Teletext-64".  Notice
how there is also true lower case, not the reverse
upper case letters that merely represent lower
case characters in other Color Computer programs.

Telewriter-64 is truly the most powerful and
sophisticated word processor you can buy for your
Color Computer or TDP-100.  If you own a printer
or are thinking of getting one, you really should
not be without this program.  Telewriter can be
used with any 16K, 32K or 64K system and with any
Color Computer compatible printer.

A B C D E F G H I J K L M N O P Q R S T U V W X Y
Z 1 2 3 4 5 6 7 8 9 0 ! " # $ % & ' ( ) * = [ @ ;
a b c d e f g h i j k l m n o p q r s t u v w x y
z , . / ; < > ? + ! " # $ % & ' ( ) * : = - █
```

***DISK . . . . . . . $59.95***
***CASSETTE. . . $49.95***

Colorware researched the word processors available for the Color Computer. This is the best. Telewriter-64 is a truly sophisticated system that is marvelously easy to use. It works with any 16K, 32K or 64K system and any CoCo compatible printer.

## TOP-RATED COCO WORD PROCESSOR

COLORWARE

VISA MasterCard

## TOLL FREE ORDERING
## 800-221-0916

ORDERS ONLY. N.Y. & INFO CALL (212) 647-2864

# 'REAL TALKER'

## HARDWARE Voice Synthesizer

## NEW from COLORWARE.. only... $59.95

'REAL TALKER'
COLORWARE
REAL TALKER
TEXT TO SPEECH
COLORWARE
PHONETIC SPEECH DICTIONARY for the SC-01 SPEECH SYNTHESIZER
VOICE SYNTHESIZER
MANUAL

### THINKING OF BUYING A COCO VOICE SYNTHESIZER?

### READ THIS....

Making your computer talk couldn't be any easier! 'Real Talker' is a full featured, ready to use, HARDWARE voice synthesizer system in a cartridge pak. It uses the Votrax SC-01 phoneme synthesizer chip to produce a clear, crisp voice.

### FREE TEXT-TO-SPEECH

Included free with 'Real Talker' is Colorware's remarkable Text-to-Speech program. This is a truly powerful machine language utility. What it does is automatically convert plain English to speech. And it has an unlimited vocabulary! For example, use it in the direct mode: Type in a sentence or a paragraph, even mix in numbers, dollar signs, etc., then press enter. The text is spoken. At the same time a phoneme string is generated which can be saved to cassette or disk, modified or used in a Basic program.

We originally planned to sell this major piece of programming for about $40.00 but decided it was so useful that no 'Real Talker' user should be without it. Besides, it really shows off the capability of 'Real Talker'.

Also included with 'Real Talker' is our unique Phoneme Editor program. It allows you to explore and create artificial speech at the phoneme level. Phenomes are the fundimental sounds or building blocks of word pronunciation. There are 64 different phenomes, as well as 4 inflection levels at your disposal. Creating and modifying speech at the phenome level is both fascinating and educational. The Phenome Editor may also be used to customize the pronunciation of speech produced by the Text-to-Speech program.

You don't have to use any of our utility programs though. If you write your own Basic Programs, you will find the pocket sized Votrax Dictionary (included free) is all you need to make your own Basic programs talk. This dictionary gives you quick access to the phenome sequences used to create approximately 1400 of the most used words in the English language.

How about compatibility? 'Real Talker' is compatible with any 16K, 32K, 64K, Extended or non-extended Color Computer. It works with any cassette or disk based system, with or without the Radio Shack Multi-slot expander. No other synthesizer under $100 can make this claim. Most other CoCo voice synthesizers require an expensive Multi-slot expander in order to work with the disk system. 'Real Talker' requires only an inexpensive Y-adapter. This is an important consideration if you plan on adding a disk or have one already.

'Real Talker' comes completely assembled, tested and ready to use. It is powered by the CoCo and talks through your T.V. speaker so there is nothing else to add. Price includes Text-to-Speech and other programs on cassette (may be transferred to disk), User Manual and Votrax Dictionary. ONLY .............................. $59.95

'Y-BRANCHING CABLE' For disk systems. This 40-pin, 3 connector cable allows 'Real Talker' to be used with any disk system .................................... $29.95

### YOU DECIDE....

Order yours today on our Toll-Free Order Line. If you are not delighted with your 'Real Talker' system, simply return it within 30 days for a prompt, courteous refund.

**COLORWARE**

COLORWARE INC.
78-03F Jamaica Ave.
Woodhaven, NY 11421
(212) 647-2864

VISA
MasterCard

**★ ★ ★ ORDERING INFORMATION ★ ★ ★**

ADD $2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD $3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS $4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.

PROFESSIONAL PROFESSIONAL PROFESSIONAL PROFESSIONAL

PROFESSIONAL

*REAL EIGHTY-COLUMN DISPLAY!*

PROFESSIONAL

# *ULTRA* TERM +

NEW

see us at RAINBOWfest CHICAGO

NEW

PROFESSIONAL PROFESSIONAL PROFESSIONAL PROFESSIONAL

This program is the **ultimate** in coco communicating!! ***Ultra* Term +** is used with a plug-in 80 column board* that gives you **True** 80 columns, not the graphics display that is unreadable at 80 columns. This is truly a ***Professional*** Package that is so easy to use that once you have used it, you'll wonder why other packages are so difficult to use, (except for Color Term + Plus + that is!) After using a terminal program that cannot give you **True** mainframe terminal emulation, you will find ***Ultra* Term +** indispensable! ***Ultra* Term +** even has a host mode that allows you to echo characters like full duplex mainframes do! There are also 10 macro keys which will allow you to save passwords, phone numbers, modem programming information, etc. + PLUS + you can save them to tape (Rom Pack, Tape Versions) or disk (Disk Version). Also, like all ***Professional*** terminal programs you can save your current parameters. This saves you set up time when moving from one system to another. + Plus + when used with the parallel printer port** you can print either what is coming in, or print what you saved in your space buffer (64K systems only support the space buffer option) if you like. And what about documentation? Every feature is explained in detail and indexed for fast look up! There is also a comprehensive help section to aid those unfamiliar with telecommunications. Although this program was designed for the Professional a total novice can use it with ease. Check all the features listed below and then you decide who has the world's smartest terminal!

Baud Rates: 110-4800 (communicate)
600-9600 (printer).

Screen Format: 80 x 25 w/true upper & lower case.

Select half, full duplex or echo.

Select odd, even, mark, space or no parity.

Send all 128 characters from keyboard.

Select 7 or 8 bit words.

Select 1 or 2 stop bits.

Send a true line break.

Select all caps if needed.

Automatic capture of incoming files.

X on/X off capabilities.

Merge text or programs in buffer.

53,000 character buffer (64**K**).

Split buffer option (64**K**).

10 macro keys.

Four buffer send modes (dump, prompted, manual & time delay).

Buffer size indicators (bytes used & bytes remaining).

Buffer editor w/auto key repeat.

Scroll forward & reverse to view buffer & print viewed screen option.

Selectable printer formats (line feeds, etc.).

Selectable trapping of incoming characters.

Print while receiving data*.

Spool received data while receiving more (64K).

Buffer editor has these features:

Move forward and reverse through buffer. Insert, type over, delete lines or characters.

Block deletion or start to end of buffer delete.

Save and load macros.

Save and load parameters.

Use 1-4 disk drive (w/SAVE, LOAD, DIR. & granule display).

Easy to use MENU driven format.

Comprehensive users manual.

Works with **ALL** Radio Shack™ Disk Systems and **all** models of color computers.

Still not convinced? How about a 15 day, money back guarantee? If you don't like the package for any reason, we will refund your money upon return of a like-new package.† Who out there is offering you this kind of deal? And customer support was never better. Simply fill out your registration card and send it back to us and you will be notified when new features, improvements, etc. become available because all registered owners will receive **Free** upgrades for a $5.00 shipping and handling fee).

As with all good Professional programs, ***Ultra* Term +** is **all machine code.** This program has been tested by those both familiar and unfamiliar with communications programs. And when you call for some technical support, you **won't** get an answering machine during our business hours (10-5 CST M-Sat.) under normal circumstances. Technical help is usually available all day.

Note: Color Term + PLUS + should have all of the same capabilities described above by the time you read this ad, but call first to make sure. ***Ultra* Term +** is ready to ship **now.**

**PRICE: *Ultra* Term +** — $55.95 (Disk/Tape)

**Color Term + Plus + (V5.0)** $45.95 (Disk/Tape)

**Word·Pak** (Includes a software driver so you can use your basic programs with no modification in most cases!)...**$139.95** + $3.00 S&H

**Y-Cable**...**$29.95** (Required if expansion port not used with disk drives)

Complete Package ***Ultra* Term +**, Word·Pak & Y Cable [subtract $20.00 if not needed] is only **$210.00**

****Ultra* Term +** supports the 80 column board made by PBJ, Inc. If you already have the board, simply order the program, but those of you who don't can get a good deal.

**Parallel Printer Port from PBJ, Inc.

†Less $10.00 restocking charge.

***Canadians***
Kelly Software Distributors Ltd.
P.O. Box 11932
Edmonton, Alberta.
(403) 421-8003

MasterCard

**Double Density Software**
920 Baldwin Street
Denton, Texas 76201
Phone 817/566-2004.

VISA

```
240 PRINTTAB(15)"PRESSING (ENTER
)"
250 PRINT:INPUT"WHICH ONE";A
260 IFA=0THEN810
270 ON A GOSUB290,300,310,320,33
0,340,350,360,370,380,390,400,41
0,420,430,450,460,470,480,490,50
0,510,520,530,540,550,560,570,58
0,590,600,610,620,630,640,650,66
0,670,680,690,700,710,720,730,74
0,750,760,770,780,790,800
280 CLS:PLAYP$:GOTO200
290 P$="T2P4V15L16O4CEGL8O5CL16O
4AL4O5C":RETURN
300 P$="V25O2T6L4GABO3DCCEDDGF#G
DO2BGAGO3CDEDCO2BABGF#GADF#AO3CO
2BABGABO3DCCEDDGF#GDO2BGABEO3DCO
2BAGDGF#L2.G":RETURN
310 P$="O1V25T25L2CCCC":RETURN
320 P$="O1V25T25L2C+C+C+C+":RETU
RN
330 P$="T2O3V22P2L4DL3FL8DL4CL3F
L8CO2L4B-O3CDL2CP12L4CL3EL8DL4CO
2B-DL1FP2":RETURN
340 P$="V25T3O3P4L2CL3CL8CL2CE-L
8DL3DL8CL3CO2L8BO3L2CP2":RETURN
350 P$="T22O5L6CECE":RETURN
360 P$="O2T200V30L2EEECCDDCCDDEC
CDDEE":RETURN
370 P$="T3V25O3P2L4EEFGGFEDCCDEL
3EL8DL2DL4EEFGGFEDCCDEL3DL8CL1C"
:RETURN
380 P$="O3T200L10CC#DE-EFF#GGG#A
A#BO4CC#DE-EFF#":RETURN
390 P$="V31T1O01L4CL200O4BA#AG#G
F#FEE-DCO3BA#AG#GF#FEE-DCO2BA#AG
#GF#FEE-DC#CO2BA#AG#GF#FEE-DC#CO
1BA":RETURN
400 P$="O3DEF#G#A#O4CDEF#G#A#":R
ETURN
410 P$="O4G#F#EDCO3G#F#EDC":RETU
RN
420 P$="V15L4O4ED#ED#EO3BO4DCL4O
3AP4":RETURN
430 P$="O1;T255;1;2;3;4;5;6;;8;9
;10;11;12;O2;1;2;3;4;5;6;7;8;9;1
0;11;12":RETURN
440 P$="O2;12;11;10;9;8;7;6;5;4;
3;2;1;O1;12;11;10;9;8;7;6;5;4;3;
2;1":RETURN
450 P$="O4;T100;1;5;9;4;2;3;6;9;
6;2;7;3;7;8;5;2;3;5;7;9;9;8;4;2;
3;5;7;7;8;7":RETURN
460 P$="T100;O2;1;2;3;4;5;6":RET
URN
470 P$="O1;1;2;3;4;5;6":RETURN
480 P$="O3;T255;1;2;3;4;5;6;7;8;
9;10;11;12;O4;1;2;3;4;5;6;7;8;9;
10;11;12;O5;1;2;3;4;5;6;7;8;9;10
;11;12;O4;12;11;10;9;8;7;6;5;4;3
;2;1;O3;12;11;10;9;8;7;6;5;4;3;2
;1;O2;12;11;10;9;8;7;6;5;4;3;2;1
":RETURN
490 P$="T255;O2;1;9":RETURN
500 P$="T41;9;2;8;3;7;4;6;5;6":R
ETURN
510 P$="T6;O2L2GL4CDEFL2GCP16CL2
AL4FGABO3L2CO2CP16CFL4GFEDL2EL4F
EDCL2O1BO2L4CDECL2EL1DL2GL4CDEFL
2GCP16CL2AL4FGABO3L2CO2CP16CFL4G
FEDL2EL4FEDCDEL2FO1BL1O2C":RETUR
N
520 P$="O4;L110;V30;D;C;B;A":RET
URN
530 P$="T4O3L4CEGO4L2CO3L4GO4L2C
O3":RETURN
540 P$="T250;ABCDEFGABCDEFGABCDE
FG":RETURN
550 P$="T250;ECECECECECECECEC":RET
URN
560 P$="O1T250ECECECECECECECEC":RE
TURN
570 P$="T25L4O3CDEFGABAFEDCT20P1
05DO3":RETURN
580 P$="O3V31T32CCFGGAB":RETURN
590 P$="O4G#F#EDCO3G#F#EDC":RETU
RN
600 P$="O3DEF#G#A#O4CDEF#G#A#":R
ETURN
610 P$="V31T1O01L4CL200O4BA#AG#G
F#FEE-DCO3BA#AG#GF#FEE-DC#CO2BA#
AG#GF#FEE-DC#CO1BA":RETURN
620 P$="O3T200L10C#DE-EFF#GG#AA#
BO4CC#DE-EFF#":RETURN
630 P$="V15L4O04ED#ED#EO3BO4DCL4
O3AP4":RETURN
640 P$="T20O2ACACACACAC":RETURN
650 P$="T4O2CCDO3L2CO2L4DO3L2CL4
":RETURN
660 P$="L20O1V31BV28AV24GV20FV16
DV10C#V5C":RETURN
670 P$="L50O1V31BV30FV29DV28GV27
EV25CV23FV21CV19GV17BV15L55O2D#V
13C#V11F#V9DV7AV5BV3":RETURN
680 P$="T4O3L3CO2L8BO3L4DCP8L3FL
8EL4GFP8AP16AP16AP16AP16L2AP2L4G
FGA-AL3B-L4FGAB-O4CDO3L3AL8GL2F"
:RETURN
690 P$="T4V31L2O2GO3L2.FL6EDCO2B
L2B-L1B-L2GL2.O3GL6FEDCO2L2BL1BL
4B-L2.AL4BL6O3C#DEF#GL2AL1.B-O2L
2.B-O3L4CL6DE-FG-AL2B-L1BO2L2GO3
L2.FL6EDCO2BL2B-L1B-L4A-L2GL1O3G
L6FEDCO2L2BL1BL4B-L2AL4BL6O3CDEF
EL2GL4GL2GL1CL4DDDL1..C":RETURN
700 P$="L255V31O1ADCFBAGEDV16ACG
ADV4EABCAEDB":RETURN
710 P$="L255;O3;V31;12;11;10;9;8
;7;6;5;4;3;2;1;L255;O2;V31;12;11
;10;9;8;7;6;5;4;3;2;1":RETURN
```

```
720 P$="L255;V31;O2;1;2;3;4;5;6;
7;8;9;10;11;12;L255;O3;V31;1;2;3
;4;5;6;7;8;9;10;11;12":RETURN
730 P$="O3;V31;L10;A;V16;A;V8;A;
V3;A;V1;L20;A":RETURN
740 P$="L250;V31;O2;1;3;6;O5;1;3
;O1;11;6;11;6":RETURN
750 P$="L255;V31;O2;12;11;10;9;7
;4;O1;1;2;1;2;1;2;1;3;2;1;4;2;1;
3;P3;L255O1;V31;12;9;12;9;12;9;4
;6;4;6;1;3;1;3":RETURN
760 P$="V31T2O2L10CEGO3CP10O2L20
GO3L2C":RETURN
770 P$="T4O3L4AP16L2AL4GFL4CL3CL
4DFB-AP4FGO4L4DCO3AB-AAGL3B-L8AL
2F":RETURN
780 P$="L16O3GF#GEFGL8AL16GF#GL2
8CDEFGABO4CP8":RETURN
790 P$="V31O2T2L4AL8O3DEF+L4EC+"
:RETURN
800 PLAY"V2L30T20O5":FORI=1 TO 1
4:PLAY"V+AA+V+":NEXTI:P$="":RETU
RN
810 PRINT"DUMP LAST TUNE?"
820 A$=INKEY$:IFA$=""THEN820
830 IFA$<>"Y"THEN200
840 PRINT#-2,P$:LINE INPUT"COMME
NT:";B$:PRINT#-2,B$:GOTO200
```

The

**ORACLE II**

NEW

The Ultimate CoCo Monitor.

The ORACLE II is not a rehashed monitor program adapted to the CoCo, but a state of the art monitor designed to compliment the CoCo and its unique abilities.

Compare some of our features:

- 64K Compatible - the ORACLE II can relocate itself and its monitor screen above disk basic.
- Single Stepper - a single variable speed stepper that allows you to step both rom and ram.
- Disassembler -
- Graphics Support - allows you to step a program while watching any graphic screen, in any graphic mode, and toggle between the monitor screen and back, with one key.
- ASCII/hex search-up to a 10 byte search.
- Full screen display and editing of memory.
- Over 40 commands.

| | |
|---|---|
| CoCo disk or tape (both versions included) | $35.95 |
| Spectral or FHL Flex version | 45.95 |

(+ $2.00 shipping and handling)

RAINBOW CERTIFICATION SEAL

**MICRO MAGIC**

P.O. BOX 142, SUMNER, WA 98390
(206) 863-8762
(24 Hours)

master charge THE INTERBANK CARD

VISA

PRINT #2 *(continued from Page 14)*

were in Chicago last year, we've moved up to the main ballroom at the Hyatt-Regency Woodfield. So, there will be more space and, we hope, it should be a little bit easier for you to see it all.

I look forward to meeting many new CoCoists in Chicago; and to seeing many old friends. Please be sure to say "hello."

We're also proud that Ed Juge, who has been newly named as Director of Market Planning for Tandy/Radio Shack, will be our guest speaker for the CoCo Community breakfast on Saturday morning. Ed is a fine speaker and, I am sure, will have some interesting things to say.

A word about the CoCo Community Breakfast. We're always in the position of having to guarantee the hotel a certain number of meals 48 hours in advance of the event. While we build in a few extra seats, there are always people who are left out because they try to get tickets at the last minute. If you want to attend the breakfast, please order your tickets in advance to avoid being disappointed.

And one more thing about tickets: Remember that you can save money by ordering admission tickets in advance, too. But, those prices do not apply at the door — "at the door" tickets are a little higher. So, do make plans to be with us in Chicago and save yourself a few bucks by ordering in advance.

And, remember, **RAINBOWfest**'s location is across the street from the world's largest enclosed shopping mall. So if there is someone in your family who doesn't like CoCo (heaven forbid), there will be "something else" to do.

Finally, this **RAINBOWfest** marks a first in that we will be cooperating with the people at *Hot CoCo* magazine to feature an in-depth seminar on education. THE RAINBOW's education writer, Dr. Michael Plog, will join with Dr. Charles Santee, education writer for *Hot CoCo*, in one of the sessions. I thank Dr. Santee, Mike Nardeau, editor of *Hot CoCo*, and others for making it possible for us to set up this program. It is, to my mind, a good example of the spirit of the CoCo Community!

Our Third Anniversary Issue is but one month away. I'll have some things to say about those three years in this space next month but, in the meantime, thank you for your support of THE RAINBOW these past years.

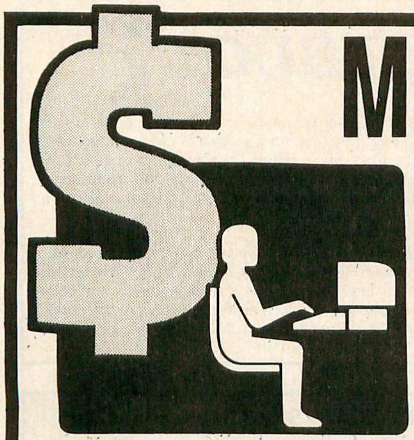
**— Lonnie Falk**

*Hints . . .*

## Disk Or Cassette I/O Errors?

Make sure that the disk drive(s) and cassette recorder are not on the left side of the TV set (or if they are, that they're at least half a foot or so away). This is because the flyback transformer (which is almost always on the left side of the TV) puts out a great deal of RFI that can interfere with cassette or disk operation.

*Ed Ellers*



# Making & Saving Money with your Home Computer Monthly

MAKING AND SAVING MONEY . . . is a monthly publication that turns your computer into a tool you can use to make and save money NOW! Besides interesting "people-oriented" SUCCESS STORIES and thought-provoking articles about how you can MAKE MONEY with your home computer, we devote columns to reviewing the FINANCIAL DATABASES and STOCK ANALYSIS SERVICES. We tell you WHERE and HOW to SHOP VIA YOUR COMPUTER for the best buys in the country.

MAKING AND SAVING MONEY . . . is written in PLAIN ENGLISH. not "computerese." After reading a few issues you'll understand why we say that YOUR EXPERTISE AND ENTHUSIASM is more important than sophisticated, esoteric computer knowledge in today's market. YOUR COMPUTER IS A TOOL. USE IT NOW TO MAKE AND SAVE YOURSELF MONEY!

I wish to subscribe to MAKING AND SAVING MONEY WITH YOUR HOME COMPUTER MONTHLY. Enclosed is my check (or money order) for $19.95 (a savings of $4.05 off the cover price) for 12 issues.

Make check payable to: Lotus Computer Publishing, Inc.
Send to: 1577 Barry Ave. Suite 201,
Los Angeles, CA 90025 (213) 207-2939
OR CHARGE MY: ___ MASTERCARD ___ VISA

Phone Orders:
**1-800-421-5300 Ext.R271**
24 Hours a day
7 Days a week

Card No. ______________________ Expiration Date ____________
Signature ______________________
Name (print) ______________________
Street Address ______________________
City ____________ State ____________ Zip ____________

# WORD PROCESSOR for your Color Computer

Only $14.95

Yes! That's right, because we want to create some excitement with an offer you can't pass up — a professional quality full screen oriented word processor that would be a bargain at $50. It's a good one too. Take a look at what you get.

MASTER WRITER's **FULL SCREEN-ORIENTED EDITOR** allows you to move the cursor anywhere in your text using the up, down, right and left arrows. Do this one character at a time or by line or page. Insert, delete or replace text at the cursor watching your changes as you make them. Delete or move blocks of text from one place to another. Merge in text from other files.

**AUTOMATIC CARRIAGE RETURN** after last complete word on each line, with this and **AUTOMATIC PAGE FEED** you don't have to worry about where a line or page ends — just type!

MASTER WRITER runs on a **16K, 32K,** or **64K COLOR COMPUTER,** taking advantage of all available memory. Use it with **DISK OR CASSETTE** based systems. **EXTENDED BASIC IS NOT REQUIRED.**

**EASY TO UNDERSTAND MANUAL** has you comfortably using MASTER WRITER in minutes. It is a **USER-FRIENDLY MENU-DRIVEN SYSTEM** with single letter commands. Check any command without having to refer to the manual with the **HELP SCREEN.**

**10 PROGRAMMABLE FUNCTION KEYS** allow easy insertion of frequently used words or phrases.

**WORKS WITH ANY PRINTER.** Take full advantage of your printer's special functions such as variable charcter size and emphzsized characters with **EASY EMBEDDING OF PRINTER CONTROL CODES.**

**GLOBAL SEARCH** function lets you quickly locate specific strings for replacement or deletion.

Customize form letters or standard text with MASTER WRITER'S **EMBEDDED PAUSE** feature. Just "fill in the blanks" when your printer pauses for a personalized appearance.

**LIMITED MULTI-TASKING** feature lets you print one file while editing another.

In addition to regular text you can use MASTER WRITER to **CREATE BASIC PROGRAMS** with the convenience of full-screen editing.

**OTHER FEATURES** include easy setting of left, right, top and bottom margin, printer line width, and lines per page. Also auto repeat keys, auto line centering, auto page numbering and choice of display color formats.

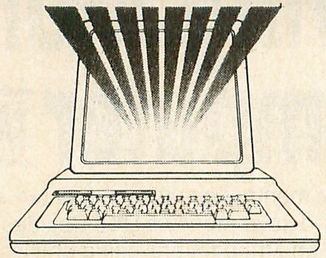
And, perhaps one of the best features, is MASTER WRITER's **SUPER LOW PRICE OF $14.95.** At this price you can't go wrong. Buy it today!

**TO ORDER** send $14.95 for cassette version or $19.95 for disk version plus $2.50 shipping (Calif. residents add 6% sales tax) to: **PYRAMID DISTRIBUTORS, 527 HILL ST., SANTA MONICA, CA 90405 (213) 399-2222.**

# MASTER WRITER

**$14.95 Cassette**
**$19.95 Disk**

# SUPER SCREEN



- A big 51 character by 24 line screen.
- Full upper and lower case characters.
- Easily combine text with hi-res graphics.
- PRINT @ is completely functional on the big screen.
- The powerful ON ERROR GOTO is fully implemented.
- Auto-key repeat for greater keyboard convenience.
- Control codes for additional functions.
- Works with 16K, 32K or 64K computers.
- Available on disc or cassette.
- Works with extended and/or disc BASIC.

### 51 CHARACTERS BY 24 LINE DISPLAY

Super Screen is a powerful, machine language program that significantly upgrades the performance and usefulness of 16K or greater, Extended and Disc Basic Color Computers. The standard Color Computer display screen is totally inadequate for serious, personal or business applications so Super Screen replaces it with a brand new, 51 character wide by 24 line screen including full upper and lower case characters. Instead of a confusing checkerboard appearance, you now have true lower case letters along with a screen that is capable of displaying 1224 characters. The difference is startling! Your computer takes on new dimensions and can easily handle lines of text that were simply too long and complex to display on the old screen.

### COMBINE TEXT WITH HI-RES GRAPHICS

You can now write truly professional looking programs that combine text with hi-res graphics. Super Screen allows you to create graphics displays with the Basic LINE, DRAW and CIRCLE statements and then notate the graphics with descriptive text. You can even use PRINT @ if you wish for greater programming convenience. Super Screen's versatility will amaze you.

### PRINT @ IS FULLY IMPLEMENTED

The PRINT @ statement is a valuable asset to the programmer when formatting text on the screen. The standard Color Computer will report an error if you specify a location higher than 511 but Super Screen allows locations all the way to 1223! You get a big screen and a powerful formatting tool as well. Of course, Super Screen also supports the CLS command allowing you to clear the big screen using standard Basic syntax.

### ON ERROR GOTO

That's right! Super Screen gives you a full implementation of ON ERROR GOTO including the ERR and ERL functions. Now you can trap errors and take corrective action to prevent crashed programs and lost data using the same standard syntax as other computers. The ON ERROR GOTO capability overcomes a serious deficiency of Color Computer Basic and greatly improves your capability to handle sophisticated tasks. All well written, 'user friendly' programs use error trapping techniques and yours can too! Now that's power!

### AUTO KEY REPEAT

No more frustration as you edit a long line in your Basic program; just hold the space bar down and automatically step to the desired position in the line. Need a line of asterisks? Hold the key down and auto repeat will give them to you. Those of you who spend many hours at your keyboard will appreciate this outstanding addition to Super Screen's long list of impressive capabilities.

### CONTROL CODES FOR ADDITIONAL FUNCTIONS

Super Screen recognizes several special control code characters that allow selection of block or underline, solid or blinking cursor and other functions. You can 'Home Up' the cursor or you may erase from the cursor to the end of a line or to the end of the screen just like many other computers. These special codes give you an extra dimension of versatility and convenience that put Super Screen in a class by itself.

### AND MORE GOOD NEWS...

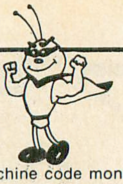
Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc Basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it! Super Screen's low price will really please you; only $29.95 on cassette or $32.95 on disc!

## 64K Memory Expansion Kit

All parts and complete instructions

**$64.95**

# NEW! SUPER BUG



Mark Data Products SUPER BUG is a powerful, relocatable machine code monitor program for your Coco. If you are a beginner, the program and documentation are an indispensable training aid, helping you to gain a better understanding of your Color Computer and machine code programming. If you are an accomplished computerist, SUPER BUG's capabilities, versatility and convenience will prove invaluable during programming and debugging.

SUPER BUG offers so many outstanding features that we are unable to list them all in this limited space. hex and alpha numeric memory display, modify, search and test; full printer support with baud rate and line feed select; up to 220 breakpoints; mini object code disassembler; 64K mode setup; decimal, hex and ascii code conversion routines and extensive documentation. Only $29.95 on cassette or $32.95 on disc.

## ORDER ENTRY SYSTEM

The Mark Data Products sales order processing system will give a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reprots, and monitor receivables. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer, and one or more disc drives.

The MDP order entry system is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 600 transactions. When the operator selects a task to be performed, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary paperwork including shipping and invoice forms, daily sales reports, a monthly (or other period) sales report and a receivables report.

The MDP system:

- Is accurate, user friendly and simple to use.
- Is easy to customize for specific user requirements.
- Produces a traceable invoice.
- Handles receivables as well as closed orders.
- In capable of future expandability.

This accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. For just $99.95.

## ACCOUNTING SYSTEM

The Mark Data Products accounting system is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, a P&L or income report, an interim or trial balance and a balance sheet.

Up to 255 separate accounts may be defined and a single disc system can hold over 1,400 transactions. This system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

The MDP system:

- Is accurate, user friendly and simple to use.
- Is easy to customize for specific user requirements.
- Immediately updates the chart of accounts.
- Provides an audit trail.
- Includes end of period procedures.
- Is capable of future expandability.

This order entry software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. For just $99.95.

## IMPORTANT NEW BOOKS

"Your Color Computer" by Doug Mosher. Over 300 pages of detailed information—A CoCo encyclopedia. $16.95.

"Programming the 6809" by Rodnay Zaks and William Labiak. One of the best 6809 machine language texts available—required reference material. $15.95.

## WE STOCK SOFTLAW PRODUCTS

The VIP WRITER Text Processor is rated tops by Rainbow, Hot CoCo and Color Computer Magazine. After evaluation we rate it tops too. **Disc $59.95.**

MD

**Mark Data Products**

see us at RAINBOWfest CHICAGO

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

All Orders: Please add $2.00 shipping and handling in the continental U.S. All others, add air shipping and $3.00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. Software authors—Contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software

# Farewell To A Dragon

As some of you know, I've been writing this column for over two years now, and I guess I've just run out of things to write about using your computer for fantasy gaming. This is my farewell to "The Dragon's Byte."

Now, don't misunderstand, I haven't given up playing fantasy games, and I haven't given up writing for THE RAINBOW either. I'm still playing fantasy games every Friday night in a group that's been together for well over three years.

As far as writing for THE RAINBOW is concerned, my next project will start next month. I will be doing a series of about six articles in a tutorial format about the creation and the handling of direct access disk files. By the end of the series, we will have written a good one of each which will be printed in THE RAINBOW.

I want to thank all of the friends I've made through these many columns for their support, ideas, and even for their criticism, which helped me to improve. Keep the light of imagination held high, and keep believing in Dragons and Unicorns.

— Bill Nolan

# RAINBOW

*Give us your best:* Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's Scoreboard column. All entries must be received by the first of the month to be eligible for the following month's Scoreboard. They must include your *full* name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o THE RAINBOW.

★ **New Number One** ● **Last Month's Number One**

**ADVENTURE** *(Flex)*
65 ★Bryan Teel, Martintown, Ontario
**ALCATRAZ II** *(Spectral Associates)*
9,820 ★Steve Manderschied, Cincinnati, OH
**ASSAULT** *(MichTron)*
2,520 ★Laura Sandman, Louisville, KY
**ASTRO BLAST** *(Mark Data)*
158,000 ★Larry Plaxton, Medley, Alberta
157,000 Scott Drake, Pine City, NY
104,464 Jim Baker, Florissant, MO
98,000 Tim Warr, Bellingham, WA
97,000 Bernard Parent, Ste-Foy, Quebec
59,475 Johnny Fritsch, Whitehall, PA
53,950 Bill Fritsch, Whitehall, PA
23,600 Janell Stroshane, Ashland, WI
**BASEBALL** *(Radio Shack)*
107-0 ★Glenn Wasson, Castleton, NY
67-2 Kent Prehn, Carol Stream, IL
64-0 Shawn Hobbs, Hutchinson, KS
60-0 Brian Kubik, Glen Burnie, MO
53-0 David McLees, Murphy, NC
33-0 ●Dan Bovey, Wheaton, IL
**BERSERK** *(Mark Data)*
24,600 ★Chip Lilley, Finleyville, PA
8,500 ●Mark Wooge, Omaha, NE
7,900 Martin Careau, Quebec City, Quebec
7,650 David Garozzo, Morrisville, PA
7,100 Scott Calberg, Hilton, NY
**BIRD ATTACK** *(Tom Mix)*
460,275 ★Kevin Boyle, Saskatoon, Saskatchewan
133,825 Ellen Ballinger, Uxbridge, Ontario
**BLACKJACK** *(Radio Shack)*
11,820 ★Woody Farmer, Acme, Alberta
**BLOC HEAD** *(Computerware)*
1,006,200 ★Lindi Wolf, Fairbanks, AK
999,825 Brian Spek, Keswick, Ontario
819,425 Keith Denhoed, Coalhurst, Alberta
781,350 Joe Golkosky, Portage, MI
395,175 Jeff Roberg, Winfield, KS
337,800 Stephane Asselin, Hauterive, Quebec
**BUSTOUT** *(Radio Shack)*
42,000 ★Derrick Kardos, Colonia, NJ
42,000 ★Martin Klein, Skokie, IL
34,700 Sara Hennessey, Golden Valley, MN
28,720 Perry Denton, New Baden, IL
27,880 Mike Wells, Pittsburgh, PA
18,403 Brad Widdup, Dundas, Ontario
**BUZZARD BAIT** *(Tom Mix)*
2,902,700 ★Michael Popovich, Nashua, NH
2,087,650 Edmund Greene, Nashua, NH
1,134,600 Richard Buttermore, Grand Rapids, MI
756,550 Andrew Truesdale, Ferguson, MO
688,550 ●David Casterson, Livermore, CA
634,950 Bruce Tenyson, Bay Minette, AL
634,800 Greg McMahon, Louisville, KY
489,600 Paul Rumrill, Gales Ferry, CT
209,050 Vince Seguin, Greely, Ontario
107,850 Randy Granger, Marion, IN
**CANYON CLIMBER** *(Radio Shack)*
1,571,300 ★Jeff Weaver, Gordonville, PA
1,400,200 ●James Stevenson, Marshall, TX
999,900 Andre Wagner, Bangor, PA
615,500 Randy Hankins, Tabor, FL
251,100 Beverly Herbers, Placentia, CA
212,800 Mike Trisel, Willshire, OH
**CASHMAN** *(MichTron)*
19,650 ★Perry Denton, New Baden, IL
16,000 Scott Oberholtzer
11,130 Ricky Susfalk, Grand Island, NY
5,690 Rob Acurto, Ballston Lake, NY
**CATCH-EM** *(Aardvark)*
79,773 ★Marsha Smith, North Vernon, IN
**CHAMELEON** *(Computerware)*
15,100 ★Janell Stroshane, Ashland, WI
**CHOPPER STRIKE** *(MichTron)*
67,900 ★Matt McCann, Louisville, KY
63,000 ●Andrew Figel, Sardis, OH
47,400 David Figel, Sardis, OH
42,100 Brian Peterson, Muskegon, MI
**CLOWNS & BALLOONS** *(Radio Shack)*
110,475 ★Andrew Truesdale, Ferguson, MO
92,480 Martin Careau, Quebec City, Quebec
89,430 ●Perry Denton, New Baden, IL
85,680 Teresa Stutsman, N. Little Rock, AR
83,710 Don Fraser, Shakope, MN
**COLOR CUBES** *(Radio Shack)*
4:10 ★Chris Cope, Central, SC
**COLOR OUTHOUSE** *(MichTron)*
528,694 ★Benjamin Hebb, Bridgewater, Nova Scotia
160,200 ●David Lazar, Englishtown, NJ
101,650 Davey Devlin, Clyde, NC
69,848 Phillip Laurell, Lansing, MI
;8,663 Bruce March, Barrie, Ontario
38,910 Dave Lauck, Williamstown, WV
14,692 Bryan Teel, Martintown, Ontario
**COLORPEDE** *(Intracolor)*
10,001,051 ★Mark Smith, Santa Ana, CA
3,355,248 Scott Drake, Pine City, NY
2,614,230 Jerry Petkash, Warren, MI
2,547,299 Rich McGervey, Morgantown, WV
2,471,342 Vincent Lok, Ontario, Canada
137,750 Barney A. Sadler, Northwood, ND
74,381 Tony Cummings, Abington, MA
**COLOR ZAP** *(Spectral Associates)*
146,510 ★Bernard Parent, Ste-Foy, Quebec
139,630 Pierre Rousseau, Cap-Rouge, Quebec
**CU*BER** *(Tom Mix)*
196,090 ★Randall F. Edwards, Dunlap, KS
49,510 Doug Kleir, Grand Rapids, MI
12,430 William Wirsig, Dunlap, KS
**CUBIX** *(Spectral Associates)*
45,056 ★Bonnie Kretschmer, Oxford, OH
38,500 Randall Edwards, Dunlap, KS
28,760 Michael Rosenberg, Prestonsburg, KY
27,780 Britt Landrum, Pensacola, FL
26,240 Perry Denton, New Baden, IL
20,360 Baird Venture, York Haven, PA
11,640 Stephane Asselin, Hauterive, Quebec
**DANGER RANGER** *(Med Systems Software)*
1,268 ★Rick Arthur, Ballston Lake, NY
**DEFENSE** *(Spectral Associates)*
103,660 ★Mary A. Brickles, Allen Park, MI
**DESERT GOLF** *(Spectral Associates)*
31 ★Kenton Fifield, Fort Francis, Ontario
**DEVIL ASSAULT** *(Tom Mix)*
1,294,300 ★John Statham, Strathroy, Ontario
294,300 Chip Lilley, Finleyville, PA
289,300 ●Michael Rosenberg, Prestonsburg, KY
271,106 Peter Niessen, Carlisle, MA
47,500 Jeffrey M. Siebert, Palm Bay, FL
**DOODLE BUG** *(Computerware)*
1,767,630 ★Perry Denton, New Baden, IL
1,180,340 Eiko Cary, National City, CA
109,660 Byron Albertson, Williams Lake, British Columbia
**DOUBLE BACK** *(Radio Shack)*
1,125,000 ★Mark Hurst, Sheridan, OR
1,080,000 Phillipe Duplanties, St. Jerome, Quebec
605,890 Peter Sherburne, Highland, CA
474,040 Paul Moritz, Butte, MT
435,570 Phillippe Morsan, St. Jerome, Quebec
47,420 Jeffrey M. Siebert, Palm Bay, FL
**DUNKEY MUNKEY** *(Intellectronics)*
1,015,000 ★Kyle Keller, Overland Park, KS
**ELECTRON** *(Tom Mix)*
45,510 ★John Sandberg, Concord, CA
41,750 ●Michael Rosenberg, Prestonsburg, KY
22,990 Alan Morris, Chicopee, MA
19,500 Robby Presson, Florissant, MO
**FIRE COPTER** *(Adventure International)*
78,860 ★Woody Farmer, Acme, Alberta
**FLYBY** *(Chromasette)*
104,980 ★David Finberg, Annandale, VA
28,910 Ron Suedersky, Universal City, TX
20,110 Rick Mansell, Calgary, Alberta
16,670 Michael Rhattigan, Cory, NC
4,830 Jeff Roberg, Winfield, KS
**FOOD WAR** *(Arcade Animation)*
208,000 ★Chris Oberholtzer
178,910 Kevin Boyle, Saskatoon, Saskatchewan
**THE FROG** *(Tom Mix)*
109.500 ★Pat Craddick, Janesville, WI
95,790 Eileen Kaakee, Royal Oak, MI
89,910 James Baker, Salt Lake City, UT
79,240 Jeanne Hawkins, Deltona, FL
73,350 Evelyn Gagnon, Ontario, Canada
**FROG TREK** *(Oelrich Publications)*
16,480 Sara Aliff, Northeast, MD
**FROGGER** *(The Cornsoft Group)*
63,800 ★Carmen Thew, Surrey, British Columbia
53,965 Ian Clark, Albion, MI
32,010 Laura Schooley, Richmond, VA
27,940 Perry Denton, New Baden, IL
25,425 Kanti Dinda, Kingston, Ontario
**FROGGIE** *(Spectral Associates)*
74,050 ★Mike Garozzo, Morrisville, PA
68,680 Carmen Thew, Surrey, British Columbia
**GALAGON** *(Spectral Associates)*
286,741 ★Rod Moore, Fork Union, VA
136,510 Mike Ashworth, Huntington, WV
95,600 Kyle Keller, Overland Park, KS
54,720 Michael Rosenberg, Prestonsburg, KY
**GALACTIC ATTACK** *(Radio Shack)*
67,750 ★Chuck Gaudette, Monroe, CT
58,000 Terry Steen, San Bernadino, CA
55,360 Donald Thompson, Lubbock, TX
54,200 Mike Hughey, King George, VA
54,000 Craig Edelheit, W. Bloomfield, MI
**GALAX ATTAX** *(Spectral Associates)*
253,900 ★Shawn McAlpin, Louisville, KY
113,650 Darrin Filand, WA
104,550 Mitch Hayden, Univ. of MN
82,650 Steve Hargis, Tucson, AZ
74,550 John Gosselin, Campbell River, British Columbia
**GHOST GOBBLER** *(Spectral Associates)*
1,007,430 ★Todd Brannam, Charleston Hts., SC
825,250 Randy Gerber, Wilmette, IL
423,390 Rich McGervey, Morgantown, WV
255,000 John Osborne, Kincardine, Ontario
228,290 Patricia Lau, York, PA
81,900 Brian Kubik, Glen Burnie, MD
**GLAXXONS** *(Mark Data)*
9,892 ★Ellen Ballinger, Uxbridge, Ontario
**GUARDIAN** *(Quasar Animations)*
24,105 ★Bill Pollack, Sherburne, NY
3,090 Davey Devlin, Clyde, NC
**INTERGALACTIC FORCE** *(Microdeal)*
254,650 ★Christopher T. Grey, Hollywood, CA
113,600 ●Alex Taylor, Manchester, England
**INVASION** *(Spectral Associates)*
52,350 ★Tina Pihl, Guilford, CT
**JUNIOR'S REVENGE** *(Computerware)*
2,099,300 ★Shawn McAlpin, Louisville, KY
1,115,300 Ryan Van Manen, Grand Rapids, MI
1,081,700 Bruce March, Barrie, Ontario
658,000 Pat Craddick, Janesville, WI
326,314 Rod Moore, Fork Union, VA
**KATERPILLAR ATTACK** *(Tom Mix)*
31,672 ★Scott Fairfield, Williamstown, MA
25,949 James A. Lafare, Williamstown, MA
18,949 ●Vadim Gotovsky, Toronto, Ontario
15,821 Alex Gotovsky, Toronto, Ontario

# SCOREBOARD

**KEYS OF THE WIZARD** *(Spectral Associates)*
662 ★Susan Ballinger, Uxbridge, Ontario
662 ★Pegi Tindle, Soquel, CA
**THE KING** *Tom Mix)*
10,000,100 ★Mark Smith, Santa Ana, CA
4,040,300 Andy Truesdale, Ferguson, MO
3,343,000 Corey Friedman, Minnetonka, MN
2,410,200 Candy Harden, Birmingham, AL
2,367,900 Richard Lacharite, Sherbrooke, Quebec
1,523,300 Roger Buzard, Lima, OH
395,900 Greg Crittendon, Elk Grove Village, IL
318,600 Larry Evans, Elk Grove Village, IL
131,700 John McJilton, Houston, TX
**KLENDATHU** *(Radio Shack)*
1,245,821 ★John Sandberg, Concord, CA
1,182,685 ●David L. Ferris, Shickshinny, PA
**KRON** *(Oregon Color Computers)*
73,530 ★Christopher Porter, Naranja Lakes, FL
**LADY BUGGY**
36,980 ★Tony Cummings, Abington, MA
**LANCER** *(Spectral Associates)*
2,797,450 ★Randall Edwards, Dunlap, KS
2,354,000 ●Alex State, Las Vegas, NV
636,500 Larry Capen, Folsom, CA
617,500 Donna Willoughby, Brookfield, IL
583,200 Sharon Casten, Folsom, CA
126,700 Greg Crittendon, Elk Grove Village, IL
113,350 Larry Evans, Elk Grove Village, IL
**LASERWORM & FIREFLY** *(THE RAINBOW)*
54,672 ★Michael Rosenberg, Prestonsburg, KY
24,338 Matthew Wilityer, Jackson, NJ
19,402 D. Seibel, Tumbler Ridge, British Columbia
18,750 Jim Partridge, Clinton, CT
**LUNAR ROVER PATROL** *(Spectral Associates)*
162,100 ★Sara Aliff, Northeast, MD
154,650 Tom Aliff, Jr., Northeast, MD
98,500 Ima Wong, Williamstown, WV
66,900 Wayne Johansen, Rocanville, Saskatchewan
66,850 Randall Edwards, Dunlap, KS
34,100 Karen Woytowich, Staten Island, NY
**MADNESS & THE MINOTAUR** *(Radio Shack)*
240 ★Pegi Tindle, Soquel, CA
**MARATHON** *(THE RAINBOW)*
101,520 ★David Dean, West Mansfield, OH
71,550 Larry Evans, Elk Grove Village, IL
55,110 Michael Rhattigan, Cory, NC
**MEGA-BUG** *(Radio Shack)*
60,000 ★Robin Worthem, Milwaukee, WI
18,902 John Tiffany, Washington, DC
15,999 Ed Mitchell, Ragged Mountain, CO
14,297 Aleisha Hemphill, Los Angeles, CA
11,894 Paschal Wilson, Kentwood, LA
8,700 Joyce Schaeperkoetter, St. Louis, MO
7,363 Janice Schaeperkoetter, St. Louis, MO
**METEORS**
14,200 ★Craig Dutton, Goose Bay, Labrador
**MICROBES** *(Radio Shack)*
406,350 ★Greg C. Strother, Madison, WI
134,630 Patrick Daley, Biloxi, MS
**MONKEY KONG** *(Med Systems Software)*
3,797 ★John Statham, Strathroy, Ontario
**MONSTER MAZE** *(Radio Shack)*
650,530 ★Bruce March, Barrie, Ontario
533,450 ●John Hankerd, Gaines, MI
300,000 James Stevenson, Marshall, TX
60,120 Steve Thomas, Ogdensburg, NY
**MOON HOPPER** *(Computerware)*
956,470 ★Shawn McAlpin, Louisville, KY
**MOON SHUTTLE** *(Datasoft)*
113,642 ★Rod Moore, Fork Union, VA
**MR. DIG** *(Computerware)*
207,800 ★Phillip Laurell, Lansing, MI
40,350 Barney A. Sadler, Northwood, ND
**MUDPIES** *(MichTron)*
156,800 ★Glenn Wasson, Castleton, NY
18,500 Steve Springer, Louisville, KY
**THE NEMESIS** *(Sorcerer Software)*
11,946,000 ★Mark Smith, Santa Ana, CA
**NINJA WARRIOR** *(Programmer's Guild)*
106,300 ★Bud Seibel, Tumbler Ridge, British Columbia
102,400 Christopher Gelowitz, Claresholm, Alberta
75,300 Brad Gaucher, Hinton, Alberta
46,400 Daniel Milbrath, Ann Arbor, MI
36,800 Greg Lowry, Davisburg, MI
**PAC-ATTACK II** *(Computerware)*
56,014 ★Lisa Welte, Baxter, TN
30,150 Jeff Weaver, Gordonville, PA
**PAC DROIDS** *(Programmer's Guild)*
1,958,500 ★Stefan Lapointe, Chateauguay, Quebec
**PAC 'EM** *(THE RAINBOW)*
1,572 ★Kenneth Bergenham, Lawton, MI
1,556 Rupert Young, Sheffield, MA
501 Stephan Bergenham, Lawton, MI
301 ●David Dean, West Mansfield, OH
**PAC-TAC** *(Tom Mix)*
100,630 ★David Dean, West Mansfield, OH
61,025 John Tyson, Superior, WI
**PHANTOM SLAYER** *(Med Systems Software)*
2,488 ★Troy Messer, Joplin, MO
1,852 Curtis Boyle, Saskatoon, Saskatchewan
1,306 Marc Hassler
652 Michael Brooks, Glade Spring, VA
604 J. Powell, Bournemouth, England
**PIPELINE** *(THE RAINBOW)*
1,110 ★Roger Buzard, Lima, OH
1,062 Kent Prehn, Carol Stream, IL
1,030 Anita Howe, Jackson, NJ
838 Johnny Fritsch, Whitehall, PA
793 Bill Fritsch, Whitehall, PA
**POLARIS** *(Radio Shack)*
63,053 ★Paschal Wilson, Kentwood, LA
**POLTERGEIST** *(Radio Shack)*
13,565 ★Michael Rhattigan, Cory, NC
6,455 Rich Van Manen, Grand Rapids, MI
4,995 Ken Mahaffey, Erie, IL
4,970 Tim Warr, Bellingham, WA
4,960 Doug Schwartz, Glendale, AZ
**POOYAN** *(Datasoft)*
279,450 ★Chip Lilley, Finleyville, PA
273,450 ●Davey Devlin, Clyde, NC
181,350 Ronny Ong, Arlington, TX
165,150 Wib Merrithew, Oshawa, Ontario
162,900 Charles Langley, Powder Springs, GA
139,800 Glenn Wasson, Castleton, NY
107,250 Woody Farmer, Acme, Alberta
104,950 Jenny Petkash, Warren, MI
84,950 Judy Langley, Powder Springs, GA
81,600 Brian Sohol, Dundee, IL
61,550 Jerry Petkash, Warren, MI
29,000 Jeffrey M. Siebert, Palm Bay, FL
**POPCORN** *(Radio Shack)*
43,970 ★Jeff Weaver, Gordonville, PA
36,210 Brad Gray, Olive Branch, MS
32,000 ●Lisa Welte, Baxter, TN
29,910 Scott Calberg, Hilton, NY
16,180 David Kennedy, Denham Springs, LA
**PROJECT NEBULA** *(Radio Shack)*
1,120 ★John Hopkins, Greenville, SC
1,065 ●William Daley, Biloxi, MS
1,065 Dan Heater, Cortland, OH
995 Dan Bovey, Wheaton, IL
960 Ian Clark, Albion, MI
465 Martin Careau, Quebec City, Quebec
**PROTECTORS** *(Tom Mix)*
594,614 ★Mark Smith, Santa Ana, CA
594,610 Roland Hendel, Mississauga, Ontario
358,514 Cameron Amick, Reisterstown, MD
347,873 Derek Mall, Long Grove, IL
275,810 Julian Bond, Berkeley, CA
**PYRAMID** *(Radio Shack)*
220/147 ★Ssg. Danial Pierce, APO San Francisco, CA
220/224 Tony & Hazel Rye, Ingleside, Ontario
220/289 Douglas G. Oxenreider, Montevideo, MN
220 Judy Fodness, Mesa, AZ
220 Britt Landrum, Pensacola, FL
210 Jeff Roberg & Kepper Mullett, Winfield, KS
200 Gar Donecker, E. Petersburg, FL
**RAINBOW ROACH** *(THE RAINBOW)*
102,000 ★John Statham, Strathroy, Ontario
69,600 Bill Grubbs, Columbus, IN
10,500 ●Michael Rhattigan, Cory, NC
**REACTOIDS** *(Radio Shack)*
88,615 ★Robbie Anderson, Monrovia, CA
36,320 Roger Rothove, Warrensburg, MO
26,275 Jeff Loeb, Mobile, AL
**RETURN OF THE JET-I** *(ThunderVision)*
372,782 ★Roger Buzard, Lima, OH
148,112 Matt Griffiths, Stilwell, KS
135,306 Peter Niessen, Carlisle, MA
**ROBOTTACK** *(Intracolor)*
2,216,950 ★Randy Hankins, Tabor, IA
1,922,200 Erik Merz, Noblesville, IN
1,512,200 Robert Kiser, Monticello, MS
1,424,300 John Osborne, Kincardine, Ontario
1,219,810 Steve Skrzyniarz, Tacoma, WA
**SANDS OF EGYPT** *(Radio Shack)*
82 ★Shawn Hobbs, Hutchinson, KS
82 ★John Allocca, Yonkers, NY
87 Kim Van Camp, State Center, IA
106 Sean Haynes, Naples, ME
**SCARFMAN** *(Cornsoft)*
253,920 ★Scott Boulanger, Columbus, OH
**SEA DRAGON** *(Adventure International)*
137,500 ★Peter Niessen, Carlisle, MA
75,750 ●Steve Schweitzer, Sewell, NJ
60,430 Steve Skrzyniarz, Tacoma, WA
56,760 Alan Morris, Chicopee, MA
50,300 Remi Riess, Val Caron, Ontario
**SEA QUEST** *(Mark Data)*
140 ★Shawn Hobbs, Hutchinson, KS
230 ●Casey Stein, Binghamton, NY
**SHARK TREASURE** *(Computerware)*
245,000 ★Manon Bertrand, Hauterive, Quebec
175,000 Maurice Boyle, Saskatoon, Saskatchewan
**SHENANIGANS** *(Mark Data)*
164 ★Richard Booth, Westerville, OH
**SHOOTING GALLERY** *(Radio Shack)*
120,640 ★Robert J. Wallace, Waldorf, MD
59,520 Vernell Peterson, Radcliff, KY
44,870 Mark Nichols, Birsay, Saskatchewan
44,480 R. Duguay, St. Bruno, Quebec
31,340 Martin Peterson, Lynchburg, VA
**SKIING** *(Radio Shack)*
12.08 ★Kelly Kerr, Wentzville, MO
13.73 Janell Stroshane, Ashland, WI
21.35 Jean-Claude Taliana, Brossard, Canada
29.52 Andrew Truesdale, Ferguson, MO
44.02 Brad Gaucher, Hinton, Alberta
**SLAY THE NEREIS** *(Radio Shack)*
147,521 ★Ed Meyer, Vancouver, British Columbia
**SNAIL'S REVENGE** *(THE RAINBOW)*
34,860 ★Michael Rosenburg, Prestonsburg, KY
11,380 Varunee Turner, Kamloops, British Columbia
6,880 Rupert Young, Sheffield, MA
6,150 Alan Sadler, Northwood, ND
5,690 Clayton Martin, Ontario, Canada
1,510 Sean Haynes, Naples, ME
1,010 Matthew Wilityer, Jackson, NJ
920 Anita Howe, Jackson, NJ
**SOLO POKER** *(Radio Shack)*
850 ★Granville Bonyata, Tallahasse, FL
740 Allan Mercurio, Portsmouth, RI
**SPACE ACE** *(Spectral Associates)*
1,364 ★Perry Denton, New Baden, IL
**SPACE AMBUSH** *(Computerware)*
1,035,680 ★Curtis Boyle, Saskatoon, Saskatchewan

# MORE... RAINBOW SCOREBOARD

| | |
|---|---|
| **SPACE ASSAULT** *(Radio Shack)* | |
| 1,632,450 | ★Walter Brokx, Granisle, British Columbia |
| 537,200 | Martin Careau, Quebec City, Quebec |
| 358,660 | Mike Snelgrove, Oshawa, Ontario |
| 354,860 | Bruce Madariaga, College Park, MD |
| 238,580 | John Cole, King City, Ontario |
| 93,210 | Paschal Wilson, Kentwood, LA |
| **SPACE INVADERS** *(Spectral Associates)* | |
| 4,862,040 | ★F.U. Ingham, Clyde, WI |
| 36,960 | Sean Dutton, Goose Bay, Labrador |
| 12,760 | John McJilton, Houston, TX |
| **SPACE RACE** *(Spectral Associates)* | |
| 60,125 | ★Mark Nelson, Kent, WA |
| 37,600 | Michael Rosenberg, Prestonsburg, KY |
| **SPACE SHUTTLE** *(Tom Mix)* | |
| 595 | ★Steve Schweitzer, Sewell, NJ |
| 585 | Kenton Fifield, Fort Francis, Ontario |
| 585 | Randall F. Edwards, Dunlap, KS |
| 575 | David J. Banks, Greendale, British Columbia |
| 575 | Fred Weissman, Brookline, MA |
| **SPACE WAR** *(Spectral Associates)* | |
| 400,190 | ★Mark Felps, Bedford, TX |
| 365,550 | Randall Edwards, Dunlap, KS |
| 116,000 | Peter Niessen, Carlisle, MA |
| 52,380 | Jim Baker, Florissant, MO |
| 15,420 | Mark Nelson, Kent, WA |
| **SR-71** *(Tom Mix)* | |
| 2,570 | ★Dominique Hall, Williamstown, WV |
| **STARBLAZE** *(Radio Shack)* | |
| 9,050 | ★Judith Simon, Warrendale, PA |
| 8,000 | Lee Van Dyke, Lansing, MI |
| 7,350 | James Hawerbier, Elmhurst, IL |
| 6,250 | Mark Welte, Baxter, TN |
| 5,900 | Daniel Byrd, Callahan, FL |
| **STARFIRE** *(Intellectronics)* | |
| 10,000,050 | ★David Tillery, University of Minnesota |
| 3,444,500 | John DeMuth, Prairie de Chien, WI |
| 2,102,450 | Dean Bouchard, Kingston, *Nova Scotia* |
| 1,420,000 | Steve Schweitzer, Sewell, NJ |
| 1,000,050 | Chuck Ladig, Suisun City, CA |
| **STARSHIP CHAMELEON** | |
| 95,900 | ★Craig Dutton, Goose Bay, Labrador |
| **STAR TREK** *(Adventure International)* | |
| 95 | ★Granville Bonyata, Tallahassee, FL |
| 94 | John Brackett, Chicago, IL |
| **STORM ARROWS** *(Spectral Associates)* | |
| 168,000 | ★Steven Ohsie, Deer Park, TX |
| 68,400 | ●Jim Irvine, Sudbury, Ontario |
| **TIME BANDIT** *(MichTron)* | |
| 129,240 | ★Brian Larrson, Fridley, MN |
| 109,170 | ●Mark Wooge, Omaha, NE |
| 106,720 | Glen Heidebrecht, Topeka, KS |
| 92,620 | Lix Noel Flores, Vallejo, CA |
| 75,640 | Sally Naumann, Hailey, ID |
| 34,770 | Fred Naumann, Hailey, ID |
| 32,710 | John McJilton, Houston, TX |
| 17,990 | Monique Amyolte, Blairmore, Alberta |
| **TRAILIN' TAIL** *(THE RAINBOW)* | |
| 33,454 | ★Kenneth Bergenham, Lawton, MI |
| 24,415 | ●Kentong Fifield, Fort Frances, Ontario |
| **TRAPFALL** *(Tom Mix)* | |
| 113,408 | ★Rich Trawick, N. Adams, MI |
| 104,456 | Robert Cattral, Ottawa, Ontario |
| 104,424 | Brennan Baybeck, Traverse City, MI |
| 104,368 | John Osborne, Kincardine, Ontario |
| 98,588 | Dan Burch, Louisville, KY |
| 56,608 | Gary Bachtel, Huntsville, AL |
| **TRIPLE YAHTZEE** *(Software Factory)* | |
| 2,319 | ★Betty Gable, Poulsbo, WA |
| **TUBE FRENZY** *(Aardvark)* | |
| 544,560 | ★Perry Denton, New Baden, IL |
| 240,060 | Randall Edwards, Dunlap, KS |
| 230,000 | Ken Felix, Crystal Lake, IL |
| 101,650 | Lloyd Albertson, Williams Lake, British Columbia |
| **TUT'S TOMB** *(Mark Data)* | |
| 53,520 | ★Bill Sanders, San Diego, CA |
| 31,740 | ●George Kaakee, Royal Oak, MI |
| **VENTURER** *(Aardvark)* | |
| 6,718,200 | ★Kyle Keller, Overland Park, KS |
| 4,126,200 | Greg Scott, Orlando, FL |
| 2,291,100 | Mike Sitzer, Roslyn, NY |
| 2,657,350 | Brian Panepinto, Spencerport, NY |
| 1,769,400 | Todd Hauschildt, Red Wing, MN |
| **WACKY FOOD** *(Arcade Animation)* | |
| 105,100 | ★Stephane Asselin, Hauterive, Quebec |
| **WHIRLYBIRD RUN** *(Spectral Associates)* | |
| 516,450 | ★Dan Shargel, Arroyo Grande, CA |
| 103,900 | Dann Fabian, Crestview, FL |
| 98,400 | Dave Lubnow, Sussex, NJ |
| 87,350 | Philip Daulton, Louisville, KY |
| 73,950 | Pat Craddick, Janesville, WI |
| **WILDCATTING** *(Radio Shack)* | |
| 63,723 | ★Michael Rosenberg, Prestonsburg, KY |
| 48,682 | David Rodgers, Carbondale, IL |
| 38,318 | Ellen Ballinger, Uxbridge, Ontario |
| 34,828 | Kerri Dutton, Goose Bay, Labrador |
| 29,953 | Lisa Ballinger, Uxbridge, Ontario |
| **ZAKSUND** *(Elite Software)* | |
| 1,256,000 | ★Robert Conyer, Willingboro, NJ |
| 1,128,050 | Richard Minton, West Frankfort, IL |
| 1,008,100 | Andy Mickelson, Granville, OH |
| 950,500 | Michael Rothman, Solon, OH |
| 910,000 | Steve Schweitzer, Sewell, NJ |
| 298,850 | Scott Eric Boulanger, Columbus, OH |
| **ZAXXON** *(Datasoft)* | |
| 1,510,000 | ★James Quadrella, Brooklyn, NY |
| 401,900 | Mike Hughey, King George, VA |
| 370,400 | Chris Coyle, Selden, NY |
| 260,600 | Roger Buzard, Lima, OH |
| 235,200 | Rich McGervey, Morgantown, WV |
| 196,500 | F.U. Ingham, Clyde, WI |
| 121,600 | Bryan Teel, Martintown, Ontario |
| 110,400 | Ricky Manna, Kenosha, WI |
| 103,500 | Johnny Fritsch, Whitehall, PA |
| 102,800 | Charlie McIntosh, Omaha, NE |
| 97,500 | Paschal Wilson, Kentwood, LA |
| 93,200 | Janice Schaeperkoetter, St. Louis, MO |
| 81,300 | Matthew Wilityer, Jackson, NJ |
| 79,800 | Jeffrey M. Siebert, Palm Bay, FL |
| 78,600 | Rupert Young, Sheffield, MA |
| 77,800 | Tony Cummings, Abington, MA |
| 75,300 | Joyce Schaeperkoetter, St. Louis, MO |
| 74,400 | Jason Brotherhood, Dover, PA |
| 72,400 | Mark Nelson, Kent, WA |
| 58,100 | Bill Fritsch, Whitehall, PA |
| **ZERO G** *(Chromasette)* | |
| 52,235 | ★Mark Smith, Santa Ana, CA |

***— Kevin Nickols***

# SCOREBOARD POINTERS

In conjunction with THE RAINBOW's Scoreboard, this issue marks the introduction of a new department, Scoreboard Pointers. We hope that this forum will provide our game-playing readers with the answers that they seek and we invite all of those with clues and pointers to submit them for our readers' benefit.

### IMMORTALITY FOR A SASE

*Scoreboard:*

In regard to the letter in the March '84 RAINBOW concerning extra lives in the Spectral Associates game *Naugus*, I can only say, life is tough. *Naugus* is an arcade-style Adventure game in which you may either complete your task or die trying. As such there are no extra lives to be had in the course of normal play, although wise use of healing may extend one's life almost indefinitely. If you get eaten by the dragon, then you should try harder the next time.

To those who have tried to the point of hopelessness, though, and are willing to give up the satisfaction of true success, a way to get extra lives is possible. Send a SASE to me at 401 Charles St., 15210, and I will send you a method to grant yourself as many lives as you wish!

*Tom Stephenson*
*(Author of* Naugus*)*
*Pittsburgh, PA*

### GHOSTLY-ARROW SHENANIGANS

*Scoreboard:*

I have a couple of game tips for your readers. On Radio Shack's *Poltergeist*, the cars will not come out if you hold down the fire button. And on *Canyon Climber*, complete the lower level of the Indian Screen, climb to one of the higher levels, and then climb back down. The arrows will not kill you but you can still score by jumping them.

Now, I have a problem. In Mark Data's Adventure *Shenanigans*, I have been able to get all of the items in the apartment and opened the door, but now I can't get out. If you can help, write to me at Box 59, T0M 0A0.

*Woody Farmer*
*Acme, Alberta*

---

*Scoreboard:*

I have a few tips for people who own the games *Whirlybird Run* and *Poltergeist*. In *Whirlybird Run*, I find the best way to get past the third screen is to stay in the middle and make sure you do not move your chopper vertically unless you have to. Of course, keep firing in case you can blow up some fuel, and travel at half speed. In the Rescue Screen of *Poltergeist*, wait for the poltergeist to appear but do not shoot him. Allow him to return back to the girl, then let him reappear once more as the ghost. This time he will get massive and he is thus easier to shoot. Do this all eight times.

*Bryan Jenner*
*Calgary, Alberta*

---

*Scoreboard:*

Anyone who would like help solving *Sands of Egypt* can write to me at 8150 Quaas Ave., 55387. Also, *Pyramid* has had me stumped for over six months. How do you get out of the pit? Any help would be appreciated.

*Paul Stemper*
*Waconia, MN*

### GOT THE KING OVER A BARREL

*Scoreboard:*

I have a couple of tricks that can be used on *The King* by Tom Mix. On the first level there is a broken ladder. The barrels *never* come down this ladder, so it is a good way to escape a large number of them. On the second level, once the ape stops thumping, you can walk behind him. Also on this level there is a hard but effective way of scoring more bonus points. Knock out all the pegs on the left side, then go to the top right-hand peg and jump right in the middle of it. Mario will fall and hit all four pegs on the way down, scoring about 500 bonus points. You must land exactly on it or it won't work.

If anyone has clues for *Madness and the Minotaur*, I could use some help. How do you get out of the maze of tunnels, how do I know when I have a spell, how do I use it, and how do I correctly use the verb "jump." Please write to me at 2122 Navy St., 90405.

*James Toomey*
*Santa Monica, CA*

*Scoreboard:*

For those of you with the Radio Shack game *Klendathu*, I have one tip that you might not have noticed. As soon as you come on the strategic board at the beginning of each drop, wait for about 10 seconds. If a bug group comes under you, go for them. Six times out of 10 it will be a queen nest. The really good ones usually are there when you arrive, or right afterwards. Have your finger on the CLEAR key, ready to go when you make your jump.

Now, for those with *Adventure Trilogy*, by ColorQuest, I have found that abbreviations may be used even though the documentation does not mention it. In the case of words like PULL and PRESS that begin with the same letter, just use PU and PR. If anyone would like to exchange tips on *Trilogy*, write to me at 1032 E. Rainbow Dr., 38107.

*John Tynes*
*Memphis, TN*

### SCORE ONE FOR MARK

*Scoreboard:*

Through trial and error, I have found a way to save the high scores on cassette or disk for *Galax Attax*. When your game is over and the high score table is on the screen, press the Reset button, then press RECORD and PLAY on the recorder and type *CSAVEM "GALAXHI",8056,8102,7992* and ENTER. The next time you load the game, type *EXEC* ENTER as usual, and when the "Enter Your Initials" prompt appears, press Reset, ready your recorder, and type *CLOADM "GALAXHI"*ENTER. When the OK prompt appears, type *EXEC* ENTER and the game will start with the high scores in memory. The scores only need to be saved before the machine is turned off, *not* after every game.

*Mark Raphael*
*Englishtown, NJ*

*Scoreboard:*

I finally defeated the wizard in *Dungeons of Daggorath* and won the game. Anyone that has any questions about this Adventure, send an SASE with your questions to me at 7809 Hermosa, 79108.

*Mike Ruggles*
*Amarillo, TX*

*Scoreboard:*

For anyone interested in knowing the incantations for the rings in *Dungeons of Daggorath*, try using the old Funk and Wagnall dictionaries — guaranteed success! Also, for those of you who may not know, the vision scroll is a map of the dungeon level that you're on. Try using the Hale flask on the third level, the Thews flask only works when you're in a dangerous situation, and the Abye flask always seems to kill me. Also, if you have two bronze shields, have one in each hand when taking a rest.

Does anyone know of a way to kill the fake wizard or how to incant gold rings? I think the solution is from one of Shakespear's plays, as are the incantations for the first two rings. Please write to me with clues at 64 Terry Lane, 94585.

*Mike Coustier*
*Suisun City, CA*

### NEEDS HELP WITH RAAKA, TOO

*Scoreboard:*

I need help on *Raaka-tu* after you get into the temple, how to obtain spells in *Madness and the Minotaur*, and how to get past the guard dog in *Bedlam*. In *Bedlam*, after you get a lobotomy, type PLUGH and it will cure you instantly. Please send clues to 230 Darmouth Rd., 60007.

*Larry Evans*
*Elk Grove Village, IL*

*Scoreboard:*

I have just solved the graphic Adventure *Shenanigans*, by Mark Data Products, and anyone is welcome to write to me at 102 Spring Hollow Lane, 43081, for clues and solutions.

*Richard Booth*
*Westerville, OH*

*Scoreboard:*

As a hint to those players of the Adventure *Bedlam* by Radio Shack, I recommend that you put the blue pill in the hamburger meat. The blue pill will dissolve in the meat and, when fed to the guard dog, you may be pleasantly surprised. This will only work sometimes due to the random features of the game. Also, I have opened a "painted door" which allowed me to escape. To get one of the characters to help (or hinder) your progress, say FOLLOW to one of them.

*Kenton Fifield*
*Fort Frances, Ontario*

*Scoreboard:*

If anybody needs help solving *Keys of the Wizard* or *Madness and the Minotaur*, they can write to me at 3430 Main St., 95073.

*Pegi Tindle*
*Soquel, CA*

*Scoreboard:*

Here are some tips to help solve Radio Shack's *Pyramid*. To get past the serpent, you need the statue of the bird. You can't pick up the Bird God without the statue box. After you get the bird, go into the room with the serpent and type THROW BIRD. Whatever you do, don't type FEED SERPENT or it will eat the statue of the Bird God.

If your lantern batteries begin to run down, you'll need to get some fresh ones, but only if you positively have to. After you get rid of the serpent, go West and get the coins. Then go West twice more, East once, and then South. You are now in an endless maze where a treasure lies hidden. Now you can DROP COINS and GET BATTERIES.

To cross the pit, which is too wide to jump, you must WAVE SCEPTER. Suddenly there will be a bridge over the pit and you can cross.

To get to the stream from the serpent's room, you must go North twice, then down, then East, and then down again. Now you can FILL BOTTLE. This is needed for the small plant in the bottom of the two-pit room. To get to the opening above the plant, you must POUR WATER on the plant twice, refill the bottle and water the plant once more. Then you can climb the plant to the hole and find two things, one of which is the key to the sarcophagus. Never, never carry more than one treasure at a time or the mummy will come and take both and put them deep in the maze.

For a neat trick, go to the serpent room, then North twice, and type PANEL. This will put you back to the beginning of the game. Repeating it will put you back into the panel room.

*Rich Van Manen*
*Grand Rapids, MI*

# Play Together, Stay Together

*Once you have a home computer, you can invite another family to share in the fun. Your block, your apartment house, your neighborhood, your collection of friends can all swap software and fellowship and become the greatest learning center possible. Play together, learn together!*

*— Laran Stardrake*

**By Fran Saito & Bob Albrecht**
**RAINBOW Contributing Editors**

"School Is In The Heart of a Child" is for parents of quite young children. We want to help you work and play with your three- to eight-year-old child and learn to use computers as a joyful family experience. We want to suggest ways to incorporate the home computer as another means to encourage your child's independence, growth, and control over his own life. See the pride on her face as she directs the computer to do what she with deliberation selects. See her head gears switch to "on" as she progresses step-by-step with your presence and caring direction.

We will explore (we hope, with *your* help ) the following:

- Specific "teaching" techniques so that the discovery can be the child's own.
- Critical evaluation of software based on extensive playtesting in family and related enviroments.
- Additional resources to consult: books, magazines, software publishers, networks, etc.
- Suggestions for interludes and fun times away from the computer (a must): call the librarian for specific information; watch a TV program together and discuss it; work together as volunteers in a community project; take a spring (or fall or winter or summer) awareness walk . . .
- Whatever we learn from families we work with in Menlo Park or from you, our readers. Let's pool our knowledge. Let's share our experiences as we all learn from our children.

We also provide small programs you can type in and use right now.

Copyright© 1984 by DragonQuest, P.O. Box 310, Menlo Park, CA 94026.

*(Fran Saito holds a degree in education from the University of Hawaii and has taught preschool and elementary students. She feels her inspiration comes from Mariko, her five-year-old daughter. Well-known author Bob Albrecht also writes the "GameMaster's Apprentice" feature for* THE RAINBOW *each month.)*

We love the letters! Thanks, folks! You are sending us beautiful letters about your experiences with your kids and your CoCo. More please. We want to share your letters with RAINBOW readers. If it is okay for us to reprint all or parts of your letter, please include permission when you write to us.

Here is our first letter to share. It is from Rene Gaudet, 2439 Danbury Drive, New Orleans, LA 70114.

> Hi,
>
> My home has two boys, ages seven and three, who use our Extended BASIC CoCo. The older boy has unlimited access to the machine and is a proficient operator who can load any tape he may want to use and also save the simple programs he writes without assistance. His interest, however, is confined to games which he thoroughly enjoys. He eagerly awaits each issue of *Chromasette* and RAINBOW ON TAPE. His actual programming achievements are far behind his capability and potential understanding because he can't match his interests and expectations to attainable results.
>
> I find that both children seem to stay interested longer and learn more if they can exercise some control and relate to what is happening. My youngest was able to recognize and associate all of the characters on the keyboard before he was three.
>
> For his first experience, I wrote a program which displayed a large character on the screen and made a sound whenever the corresponding key was pushed. He quickly tired of this but not before he learned cause and effect of pushing the keys. Next, I modified the program to display a random large letter and give a sound reward when the corresponding key is pushed.

# SUPER PRO KEYBOARD*

Radio Shack
TRS-80
COLOR COMPUTER

**Great New Price!**
**Just $64.95**

More Super Pro keyboards have been sold than any other brand for good reason. . .It is the best looking, best feeling keyboard available anywhere! The best buy for your money. Read what the reviewers have said:

**Color Computer News, June '83**

Mark Data Products is well known to us "longtimers". . . Every bit as finished as if Tandy had done it. . .The Mark Data Super-Pro is your best buy. . .The one that is in my CoCo to stay. . .

**Color Computer Magazine, June '83**

The installation procedure is well detailed and quite simple. . .Has a professional feel, reacts well to the touch. . . has held up to some purposeful pounding. . .

**Hot CoCo, August '83**

Like putting leather upholstery in your Volkswagen. . .Very impressed with the appearance and performance. . .Could easily pass as original equipment. . .Installation is very simple. . .

**Rainbow, April '83**

A fine piece of hardware from Mark Data Products. . .It is super and it is professional too. . .If you are searching for a replacement keyboard, it is an excellent buy. . .

- Original layout—no unsupported keys.
- No special software required.
- Fast, simple installation—no soldering.
- Individually boxed with full instructions.
- Professional, low profile, finished appearance.
- U.S. made—highest quality, gold contacts.
- Smooth, responsive "Touch Typist" feel.
- Fits all 'D', 'E', and 'F' board models.

*Computers produced after approximately October 1982 require an additional plug adapter. Please add $4.95.

MD

**Mark Data Products**

see us at RAINBOWfest CHICAGO

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

All Orders: Please add $2.00 shipping and handling in the continental U.S. All others, add air shipping and $3.00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. Software authors—contact us for exciting program marketing details.

Almost immediately, I had to ration the reward until after five and then 10 correct responses. Within a short time he could get every letter and character on the keyboard without any errors.

Next, I wrote a program which enabled one to enter text with characters about one inch high. Any word that interests the young student can be entered. The reading vocabulary began to grow — first, with words like 7-UP, COKE, CAT, DO, EXIT, etc. Now, Alex is able to read some simple sentences and also key-in some very simple ones. For instance, he can key-in "DAD IS BAD" or "MOM IS GOOD." This program enables me to work with him and let him interact with the words he likes. He is also able to *CLOAD* and *RUN* programs if the tape is positioned correctly.

I believe the most important thing with preschoolers is trying to find things they can relate to. Number concept for Alex started with a program which displayed a random number of fingers on a hand. When the correct number key was pushed, a large number was printed on the screen next to the hand. Shortly, a second hand needed to be added.

Mike, the oldest, is forcing me to add that it is not fair because he didn't have a computer when he was three.

I hope that some programs for preschoolers will appear in your articles in THE RAINBOW. I'd like to see what has worked well for other parents.

Very truly yours,
Rene Gaudet

Thanks, Rene! Special thanks for being a mother willing to play together, learn together with her children. We encourage you to share your programs and experiences in more detail with RAINBOW readers. Become a RAINBOW author. To remind you to do so, we are sending you a stuffed dragon. Please give her or him a name and tell us how you named him or her.

And, to help your older son match his interests and expectations to his own progress, we are sending you two books.

1) *TRS-80 Color BASIC* by Bob Albrecht.
2) *TRS-80 Color Computer Graphics* by Don Inman and Kurt Inman.

Rene mentioned *Chromasette* and RAINBOW ON TAPE. We recommend both. Look for information elsewhere in this issue. Try the "Advertiser's Index." If you can't find *Chromasette* this issue, call them at 1-800-621-6240, or in Calif. at 1-805-963-1066. Their address: *Chromasette*, P.O. Box 1087, Santa Barbara, CA 93102.

**DragonSmoke**

Is your child's school one of those schools who buy computers that cost two or three times the price of a CoCo to do things a CoCo can do better? Does the school also buy gold-plated school buses? Do the administrators and teachers cry crocodile tears about the paucity of their budget?

If you need evidence about the intrinsic ineptness of schools — and school teachers — and school administrators — look at the way they buy computers. They will spend $2000 for a computer system because "It has more educational software than any other computer." They will then use this computer with *one or two pieces of software* in the most mundane and trivial way — flashcard, flashcard, flashcard. For the same money, they could have three CoCos doing the same thing!

Schools are teacher-centered and administrator-centered and system-centered. Schools are *not* necessarily learner-centered. If your child is to learn how to learn, he or she must do it outside of school.

School is where they "learn" this thing from 9 to 9:50, that thing from 10 to 10:50 and so on all day, every day. School is where kids learn to be not-individual. School is where kids learn that to explore is to be punished. Slowly, year by year, they unlearn how to learn through exploration.

You can help your child survive school and learn to learn in a rapidly changing world. Play together, learn together!

**Fun With Letters**

We think your preschooler might enjoy this program while getting some practice pressing letter keys and watching letters on the screen.

560 . . . . . . . 47
END . . . . 135

**The Listing:**

```
100 REM**ALPHABET ANTICS SCH 5-1
200 REM**ASK FOR A LETTER
210 CLS 4
220 PRINT "PRESS ANY LETTER"
230 KY$ = INKEY$
240 IF KY$="" THEN 230
250 IF KY$<"A" THEN 230
260 IF KY$>"Z" THEN 230
300 REM**FILL SCREEN WITH LETTER
310 CLS
320 FOR K = 1 TO 255
330 : PRINT KY$ " ";
340 : SOUND RND(200),1
350 : GOSUB 1010
360 NEXT K
400 REM**REVERSE COLOR LETTERS
410 CLS
420 FOR K=1 TO 255
425 : LC = ASC(KY$) + 32
430 : PRINT CHR$(LC) " ";
440 : SOUND RND(200),1
450 : GOSUB 1010
460 NEXT K
500 REM**MOVIN' LETTERS
510 CLS
520 FOR K = 1 TO 512
530 : PRINT KY$ "  ";
540 : SOUND RND(200),1
550 : GOSUB 1010
560 NEXT K
600 REM**MOVIN' REVERSE LETTERS
610 CLS
620 FOR K=1 TO 512
625 : LC = ASC(KY$) + 32
630 : PRINT CHR$(LC) "  ";
```

# Help Us Battle the High Cost of Disk Drives

NOW . . .
V-PRINT
A utility to print directory on paper
$9.95

## Un-DISK Drives $49.95?

You Bet! There are empty spaces in your 32K and 64K CoCo. The Preble VDOS Un-DISK helps you fill them up with PROGRAMS!

- Un-DISK uses your computer's extra memory like a fast disk drive.
- Un-DISK can store BASIC and MACHINE LANGUAGE programs.
- Un-DISK is INVISIBLE. Yup! Un-DISK does not interfere with normal Color Computer Operation.
- Un-DISK appears only when you type the magic word VDOS.
- Un-DISK comes with comprehensive instructions which you may not need because:
- Un-DISK is self-prompting and easy to use!
- Un-DISK is provided on cassette.
- Un-DISK is faster than a slow clumsy DISK DRIVE and best of all . . .
- Un-DISK is CHEAPER than a DISK DRIVE!
- Un-DISK will work even if you already own a disk but WHY BUY A DISK AT ALL?
- Un-DISK should be in the library of every serious CoCo user even if you own a disk says Frank J. Esser, independent reviewer for RAINBOW Magazine!

OK sure, disk drives ARE NICE. I own one. But if your finances are limited, the Un-DISK can give you much of the power of the mechanical drive. Even if you already own a disk the Un-DISK can work like a super fast extra disk.

**EXTRA . . . EXTRA . . . EXTRA . . . EXTRA . . .**
**Additional Power For $14.95**

Only with VDUMP for the Un-DISK!

- VDUMP lets you make a cassette backup copy of everything stored in the Un-DISK.
- VDUMP lets you save 5, 10, 15 or more programs on a single cassette tape file.
- VDUMP lets you switch Un-DISKs. With a single load operation replace a group of financial programs with a set of children's programs. (The new VDUMP tape overwrites the old.)
- VDUMP can allow you to save a whole lot of RAINBOW ON TAPE in a SINGLE file.
- VDUMP is the perfect companion to the Preble VDOS Un-DISK.

Available from Doctor Preble's Programs, naturally! Bringing you fine Color Computer Products Since 1983!

| | |
|---|---|
| The Preble VDOS Un-DISK | $49.95 |
| The Preble VDUMP | $14.95 |
| Shipping & handling U.S. and Canada | $1.50 |
| or $5.00 to other foreign points | |

VISA and MasterCard accepted

DR. PREBLE'S SINCE 1983 PROGRAMS

**Order From:**
**Dr. Preble's Programs**
**6540 Outer Loop**
**Louisville, KY 40228**
**(502) 966-8281**
Canadians may order from Kelly Software

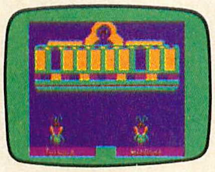
From Sesame Street to Outer Space…

# Radio Shack Has and Entertainment

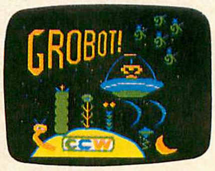
The CTW Software Group, a division of Children's Television Workshop, brings you ten game-style educational programs. Each one encourages children to experiment, explore and solve problems while having fun.

**For TRS-80® Color Computers with Extended BASIC** $19^{95}$ Each

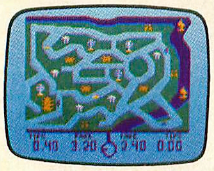
**Grover's Number Rover.**™** Grover's rover is ready to blast off! Hop aboard and help him play with Twiddlebugs and numbers! A Basic Skills Game for ages 3-6. #26-2522.



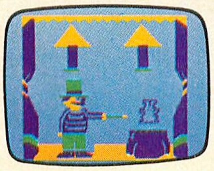
**Grobot.***** How well will your astro-garden grow? Plant, protect and harvest—it's up to you and Grobot. A Creative Exploration Game for ages 10 and up. #26-2527.



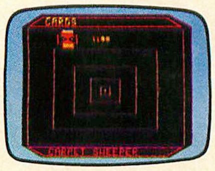
**Taxi.***** Kids earn fares and tips as they drive through six cities from New York to Shanghai. A Cooperative Strategy Game for ages 7 and up. #26-2509.



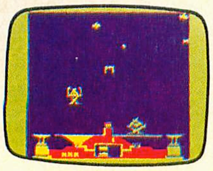
**Ernie's Magic Shapes.**™** Ernie wears the top hat, but you're the magician. Help Ernie match shapes and colors in six different ways. A Basic Skills Game for ages 3-6. #26-2524.



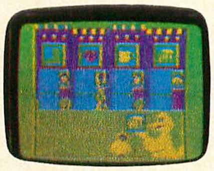
**Time Bound.***** Race through time and learn about history, in hot pursuit of your hapless assistant, Anacron. Creative Exploration Game for ages 10 and up. #26-2528.



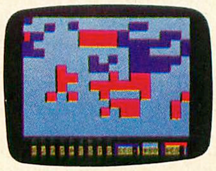
**Peanut Butter Panic.***** The sky's the limit as players cooperate to catch stars, make sandwiches, and win. A Cooperative Strategy Game for ages 7 and up. #26-2523.



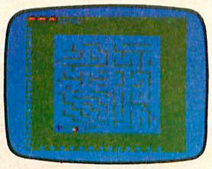
**Big Bird's Special Delivery.**™** Help Big Bird deliver the mail! Match the pictures and bring each package to the right store. A Basic Skills Game for ages 3-6. #26-2525.



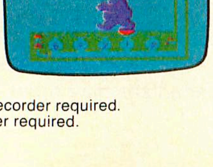
**Flip Side.***** Stake your claim, surround the squares, and watch the screen flip colors! Planning is the key. A Creative Exploration Game for ages 10 and up. #26-2529.



**Star Trap.***** Players must race through a maze to trap a slippery star before time runs out! A Cooperative Strategy Game for ages 7 and up. #26-2510.



**Cookie Monster's Letter Crunch.**™*** It's Cookie Time! Help Cookie Monster match words and letters to bake and eat cookies! A Basic Skills Game for ages 3-6. #26-2526.



---

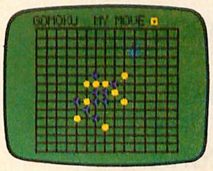
*Joysticks required. **Cassette recorder required.
***Joysticks and cassette recorder required.

# the Educational Software You Want.

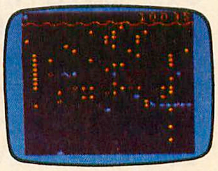
Why feed quarters into video game machines when you can bring arcade-style thrills into your own living room with Radio Shack's exciting Color Computer games. They can provide hours of fun for the whole family.

**Low As 19$^{95}$**

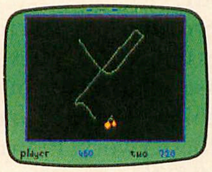
**Gomoku and Renju.** The classic oriental game of strategy! Block your opponent while attempting to place five of your own men in a row. Hours of fun. #26-3069. **$19.95**



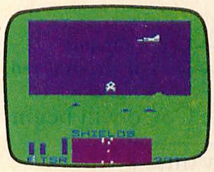
**Slay the Nerius.*** Defend your submarines against deadly starfish and the ancient seaworm—the fearsome Nerius, a creepy nemesis from the Deep. #26-3086. **$24.95**



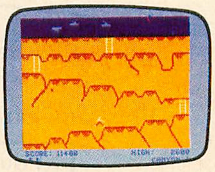
**Double Back.*** As you "double back" to catch your own tail, try to encircle the "safe" screen objects to gain points in this tricky game. Challenges mount as you play. #26-3091. **$19.95**



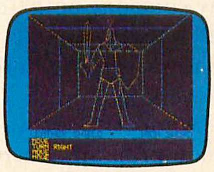
**Star Blaze.*** Protect the Milky Way! Radar shows menacing vessels nearby. Seek, destroy and check radar again. Red alert! There's no let up in the excitement. #26-3094. **$19.95**



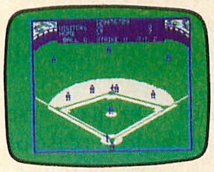
**Canyon Climber.*** An action game with a difference. As a cliff hanger, you're challenged by one test after another—kicking goats, zinging arrows and falling objects! #26-3089. **$34.95**



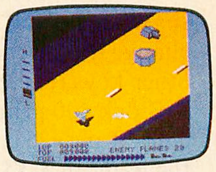
**Dungeons of Daggorath.*** You're pitted against a succession of awesome beasts. Each victory brings you closer to your ultimate opponent—the evil wizard! #26-3093. **$29.95**



**Baseball.** Nine innings of fun! You're in full control of this realistic simulation of America's Number One sport, both behind the plate and on the field. #26-3095. **$24.95**



**ZAXXON.***** The official home version of the great arcade favorite by Sega! Match wits with the deadly ZAXXON Robot! Challenges escalate as you progress. 32K required. #26-3062. **$34.95**



see us at RAINBOWfest CHICAGO

*Available at over 1100 Radio Shack Computer Centers and at participating Radio Shack stores and dealers*

**Radio Shack®**
**COMPUTER CENTERS**
A DIVISION OF TANDY CORPORATION

**NEW 1984 TRS-80 CATALOG RSC-11.**
**Send me a free copy today.**

Mail To: Radio Shack
Dept. 84-A-627
300 One Tandy Center
Fort Worth, Texas 76102

NAME ______________________
ADDRESS ______________________
CITY ______________ STATE ____ ZIP ______
TELEPHONE ______________________

Prices apply at participating Radio Shack stores and dealers. Muppet characters are trademarks of Muppets, Inc. All rights reserved. ZAXXON is a registered trademark of Sega licensed to Datasoft, Inc.

```
640 : SOUND RND(200),1
650 : GOSUB 1010
660 NEXT K
700 REM**RANDOM SCREEN LOCATIONS
710 CLS
720 FOR K = 1 TO 512
730 : SP = RND(512)-1
740 : R = RND(2)
750 : IF R=1 THEN PRINT@SP,KY$;
760 : IF R=2 THEN PRINT@SP," ";
770 : SOUND RND(200),1
780 : GOSUB 1010
790 NEXT K
800 REM**START OVER
810 GOTO 210
1000 REM**NEW LETTER SUBROUTINE
1010 KZ$ = INKEY$
1020 IF KZ$="" THEN RETURN
1030 IF KZ$<"A" THEN RETURN
1040 IF KZ$>"Z" THEN RETURN
1050 KY$ = KZ$: RETURN
1099 END
```

After you type *RUN*, the CoCo will show

```
PRESS ANY LETTER
```

**Green top line**
**Rest of screen is red.**

Press any letter key, 'A' to 'Z', and the CoCo will begin.

| |
|---|
| You can change the letter any time by pressing a letter key. |

Block 300 prints 255 copies of the value of *KY$* on the screen. You will see a letter in screen positions 0, 2, 4, 6, and so on, up to 510. Line 330 prints the value of *KY$* and one space. Line 350 uses the new letter subroutine. You can change the letter any time by simply pressing a letter key. All other keys (except BREAK) are ignored.

Block 400 prints 255 copies of the value of *KY$* in reverse color. Line 425 computes the ASCII code of the lowercase of the letter in *KY$*. Remember, on the CoCo's screen, lowercase letters appear as uppercase letters in reverse color.

Your turn: Can you change block 300 or block 400 so letters are printed in a checkerboard pattern? For example:

```
 A A A A A A A A A A A
A A A A A A A A A A A
 A A A A A A A A A A A
A A A and so on.
```

Block 500 fills the screen with many copies of the letter followed by *two* spaces. Yes, be sure you include two spaces between quotation marks in line 530.

PRINT KY$ "  ";

**2 spaces**

During this part of the show, you may see some optical illusions. Try to "follow" a letter. Does it go up, to the right, . . . ? Trap a letter between two other letters (press letter keys quickly and firmly). Watch the trapped letter. Which way does it go? What have you learned by this?

Block 600 is the same as block 500 except that the letters appear in reverse color. Line 630 prints a reverse color letter and two spaces. Can you change line 630 so the CoCo prints a reverse color letter and a random graphics character and a space? Or two random graphics characters? That would make a very colorful show for your kid — and you, of course!

Block 700 prints the letter, or a space, in random places on the screen. Can you change block 700 so the CoCo prints a random graphics character instead of the space? Or, how about a random selection of the value of *KY$*, the value of *KY$* in reverse color, or a space. You assign the relative probability of each occurring.

Block 800 sends the CoCo back to the beginning to wait for a new character. Can you change block 800 so the CoCo goes, at random, to block 300, or 400, or 500, or 600, or 700?

Perhaps you prefer to add your own block 800 or even two blocks: 800 and 900. Oh, you want more *blocks*? Move our subroutine to the line numbers of your choice and add as many blocks as you want.

Block 1000 is the subroutine that lets you change the value of *KY$* any time. That is, by pressing any letter key, you change the letter appearing on the screen. Since no one ever asks to explain this, we assume you know how this works.

Yes, we are lazy. We will explain as little as possible because explaining is hard work. However, if you write to us and ask for more explanation, we will buckle down and do it. Okay, everybody.

This program provides lots of action for a small expenditure of effort (pressing a key). Do you like it? Do your kids like it? Help! Please tell us what you like and don't like. We are trying lots of things. We need lots of help to decide what works and what doesn't work. Fran and Bob, P.O. Box 310, Menlo Park, CA 94026.

### Storyboarding

DragonQuest people spend much time watching kids use computers — using hundreds of software items. We sometimes wonder why someone bothered to write an especially bad "educational" activity or game. It is educational only in the sense that it shows us how not to do it. Other times, we revel in using software well done.

To you people who write software, we suggest you first *storyboard* your new program. Then show the storyboard to someone who understands your intended audience. Get some feedback. When you have a first draft, get more feedback. Keep at it until you get it right. Only then spring your product on an unsuspecting public.

Storyboard? Okay, we will storyboard a program or two or three in each episode of "School Is In The Heart Of A Child." We begin.

A classic game: GUESS MY NUMBER. The game is much older than computers! Here are some storyboard ideas on how to program this game for wee people who are just learning the numbers from one to nine.

Remember: These tots can't read at your level. So why bother to fill the screen with directions? We want a game that begins with mama and child or papa and child. Mama or papa plays with the child until the child can do it alone.

There was once something called Project SOLO. Dr. Thomas Dwyer and others described dual and solo modes of learning. A person learning how to fly first learns in a one-to-one (dual) environment with an instructor, then later solos (does the same thing alone).

Thanks, Tom Dwyer and those who worked with him.

You have shown us a way that can work in the home. Parent and child can work in the dual mode until the child is ready to solo. The parent can then stand back and watch proudly while the child works alone. Be ready, parent, to give a little help when asked — but keep a light touch on the controls.

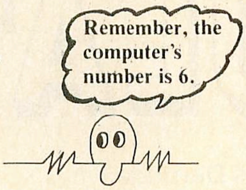
Type *RUN* and press ENTER. Our game might begin like this:

```
 1 2 3 4 5 6 7 8 9

 YOUR GUESS? ■
```

Now the child must learn two words: YOUR GUESS? This is a complete sentence, ending in a question mark. Explain that the computer is wating for *your guess*. Since the possible guesses each exist on one key, use *INKEY$* to get a guess.

Now assume the CoCo's secret number is six. A wee child enters two as her guess.

```
   >
 1 2 3 4 5 6 7 8 9

 YOUR GUESS? ■
```


Remember, the computer's number is 6.

Aha! Do you see it? Above the two you see a hint. It says, "Go that way (>)." Of course, we are happy that someday the child will learn that the symbol also means "greater than."

As you watch (silenty, we hope — let her explore), your magic child presses the '8' key.

```
   >           <
 1 2 3 4 5 6 7 8 9

 YOUR GUESS? ■
```

She looks intently at the screen. Restrain yourself — don't tell her that < means "less than." Let her learn by playing. Be patient. Let her make mistakes. *Let her learn how to learn.* Let her solo. If she asks for help, give as little as possible — but give some.

So she tries '7'.

```
   >         < <
 1 2 3 4 5 6 7 8 9

 YOUR GUESS? ■
```

Let her play. She will soon get the number. Give a big reward. Did she use a good strategy? We hope the style of the game will lead kids to discovering the *bisecting strategy*. Make your guess about half way between the closest > and <.

**Help!**

If your home has a kid, three to eight years old, and a CoCo, please share your experience in using your CoCo with your child. If you write to us, please tell us if it is okay to print all or part of your letter in this column. Fran and Bob, P.O. Box 310, Menlo Park, CA 94026.

## Submitting Material To the Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

Program submissions must be on tape or disk and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs. All programs should be supported by some editorial commentary, explaining how the program works. We're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, THE RAINBOW, P.O. Box 209, Prospect, KY 40059. We will send you some more comprehensive guidelines.

Please do not submit programs or articles currently submitted to another publication.

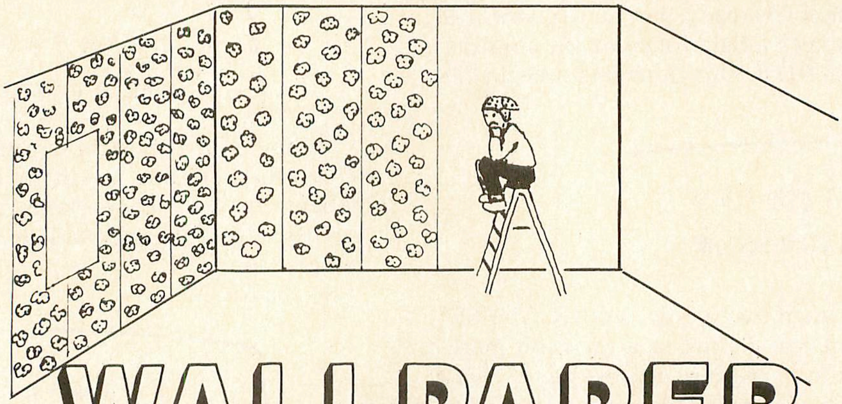
STYLOGRAPH™
and
COLOR OS/9
are a Perfect Match

By combining OS/9 and the dynamic features of Stylograph, you attain the ultimate in a Word Processing System.

- Proportional Spacing & Right Justification
- Horizontal Scrolling
- Search & Replace
- What you see on the screen is what you get on the printer.
- Uses FHL O-PAK for 51 x 24 screen

Stylograph $150 - Buy any 2, Save $25
Spell Checker $95 - Buy all 3, Save $50
Mail Merge $75

See your Local Dealer or contact us direct
VISA
Color Flex Versions also available
OS-9 is a registered trademark of Microware Systems Corp.
Great Plains Computer Company
P.O. Box 916
Idaho Falls, ID 83402
• 208-529-3210



# WALLPAPER CALCULATOR

By Dennis Derringer

If any of you out there have ever tackled "do-it-yourself" home decorating and have a cost conscious wife such as mine, then you've probably heard something like this before, "Hey, Dennis! Look! There's a sale on wallpaper. Let's figure how many rolls we need and go get it!" As my wife laid the catalog over my keyboard, I knew there was no way of getting out of the inevitable. "Here," she said. "This roll will cover this many square feet and down here is how you figure the number of rolls you need." What could be simpler, right? Wrong. Knowing that this would not stop after just one room I moved the catalog off the keyboard and started experimenting.

This is where the real fun lies in programming. Take something very simple and do it! Don't be embarrassed if it's not the program to end all programs! There's a lot to be said about the knowledge acquired from conceiving and coding short programs.

What follows is a "no bells and whistles" routine that will calculate the number of rolls needed to wallpaper a room. It starts by asking for the square foot coverage of one roll and how much it cost. Since not all rooms have four corners, it will ask for the number of walls and then the length of each wall. The third part asks for the number of openings (doors, windows) and the height and width of each.

The height and width will be entered separated by a comma. The fourth part will ask for the floor to ceiling height that will actually be covered. It then calculates the total square area of the walls and subtracts from that the total square area of the openings to find the actual area that will be covered by the wallpaper. Ten percent plus .5 (round up) is then added to allow for matching and then divided by the coverage of one roll to find the number of rolls needed.

---

*(Dennis Derringer, president of Derringer Software, Inc., is a self-taught programmer and has been marketing software for the Color Computer since 1982.)*

Since the entries must be made in feet, you might find the accompanying chart helpful in entering inches as a fraction.

| Inch | = Feet | Inch | = Feet | Inch | = Feet |
|---|---|---|---|---|---|
| 1 | = .0833 | 5 | = .4165 | 9 | = .75 |
| 2 | = .1666 | 6 | = .5 | 10 | = .833 |
| 3 | = .25 | 7 | = .5831 | 11 | = .9163 |
| 4 | = .3332 | 8 | = .6664 | 12 | = 1.0 |

```
180 ....... 183
END ...... 119
```

**The listing:**

```
10 'WALLPAPER COVERAGE
20 'DENNIS DERRINGER
30 'FEBRUARY 25, 1984
40 CLEAR 500
50 CLS
60 PRINT"ROLL COVERAGE";:INPUT R
C
70 PRINT"COST PER ROLL";:INPUT C
S
80 PRINT"HOW MANY WALLS";:INPUT
NW
90 DIM W(NW)
100 FOR A = 1 TO NW
110 PRINT"LENGTH OF WALL";A;:INP
UT W(A)
120 NEXT A
130 PRINT
140 PRINT"NUMBER OF OPENINGS";:I
```

```
NPUT NO
150 DIM OH(NO),OW(NO)
160 FOR A = 1 TO NO
170 PRINT"H,W OF OPENING";A;:INP
UT OH(A),OW(A)
180 NEXT A
190 PRINT
200 INPUT"FLOOR-->CEILING MEASUR
ES";H
210 SF=0
220 FOR A = 1 TO NW
230 SF=SF+(W(A)*H):NEXT A
240 SO=0
250 FOR A = 1 TO NO
260 SO=SO+(OH(A)*OW(A)):NEXT A
270 CV=SF-SO
280 DR=CV/RC:DR=INT(DR+(DR*.1)+.
5)
290 PRINT
300 PRINT"TOTAL SQ. FT =";SF
310 PRINT"OPENING SQ. FT =";SO
320 PRINT"WALL COVERAGE =";CV;"S
Q. FT"
330 PRINT"DOUBLE ROLLS NEEDED ="
;DR
340 PRINT"$$$ NEEDED =";CS*DR
350 PRINT
360 PRINT"PRESS ENTER TO RUN AGA
IN ";:LINE INPUT X$:RUN
```

# Corrections

Because of an error in production, the MC-10 version of *Little E* (April 1984, Page 170) lost its last five lines in the listing on Pages 180-181. Here they are:

```
440 DATA 96,139,96,222,181,167,0
450 DATA 8,223,181,222,183,8,188
460 DATA 66,128,38,223,222,181
470 DATA 111,0,126,226,134,246
480 DATA 66,130,196,112,27,32,22
6
```

H. Allen Curtis tells us that a change should be made to both versions of the *Little E* program. Here are the corrected lines for each:

**Color Computer**

```
10 CLS:X=256*PEEK(116)+16
30 X=256*PEEK(116)+17
40 FORZ=X TOX+238
70 IFW<>23220THENPRINT"DATA ERRO
R":STOP
400 DATA 206,4,0,32,18,166,192,4
3,12
```

**MC-10**

```
10 CLS:X=256*PEEK(16976)-13
30 X=256*PEEK(16976)-12
40 FORZ=X TOX+267
70 IFW<>29539THENPRINT"DATA ERRO
R":STOP
410 DATA 244,8,233,181,206,64,0,
32,28
```

Eric W. Tilenius writes: "In my *Neat Print* program which appeared in part III of my Adventure writing tutorial (April 1984, Page 40), line 50020 should not appear in the listing. Delete it and the program will perform as advertised. Also, for those who were wondering why the title was not neatly printed, just add a close quotes and a semicolon at the end of Line 20." (You may need to use the *EDIT* function to pack it in.)

In "The Home Slot Machine" (April 1984, Page 131), add these lines:

```
415 CHOICE=2
487 IFJ=K ANDJ=L THEN466
1020 'ENDING
1487 FORX=1TO1000:NEXT:FORX=OTO8
:SOUND170,2:CLSX:PRINT@32*6+5,"Y
OU END UP WITH $"P"!";:PRINT@32*
9+12,"GAME OVER";:NEXT X
1490 GOTO1490
```

Change lines 416, 422, and 428:

```
416 GOSUB608:GOSUB604
422 GOSUB608:GOSUB604
428 IFJ=K AND J=L THEN482
```

In "Craps . . . As It's Played At The Casino CoCo" (April 1984, Page 67), we made a mistake in paste-up. Somehow, a duplicate copy of 10 lines from Page 69 got inserted into the middle of Line 480 on Page 70. Line 480, in its entirety, should read:

```
480 PRINT@96," OKAY, "A$", YOU H
AVE TO MAKE "
```

We regret this error and apologize for any head-scratching it may have generated.

The *MoCalc* program (April 1984, Page 186) has a few disk commands that were unrecognized when *LLISTed* in ECB, resulting in exclamation marks appearing in the listing. The correct lines:

```
1020 FORT=1TO9:FORY=1TO43:WRITE#
AA,L$(T,Y):WRITE#AA,I$(T,Y):NEXT
Y,T
1040 IF RF=1 THEN KILL NA$+"/DAT
":RENAME TA$+"/DAT" TO NA$+"/DAT
":TA$=NA$:GOTO 170
1090 FORT=1TO9:FORY=1TO43:INPUT#
AA,L$(T,Y):INPUT#AA,I$(T,Y):NEXT
 Y,T:CLOSE#AA
```

*(more corrections on Page 246)*

# CONNECT WITH CONFIDENCE

gemini-10X
star

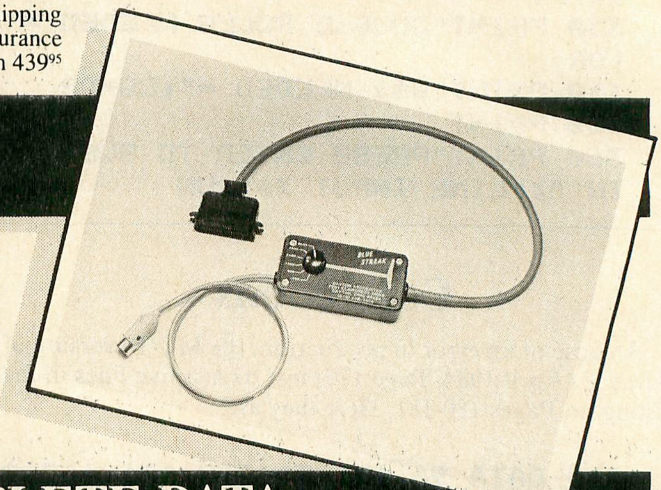
## GEMINI-10X
## COMPLETE SYSTEM

**PRINT SPEED**—120 cps, Bidirectional Logic Seeking
**PRINT SIZE**—10, 12, 17, 5, 6, 8.5 cpi
**NUMBER OF COLUMNS**—80, 96, 136, (40, 48, 68 in Double Wide)
**CHARACTER MATRIX**—9 x 9 Standard, with True Descenders • 18 x 9 Emphasized • 18 × 18 Double Strike • 6 x 6 Block Graphics • 60 x 72 Low Resolution, Bit Image Graphics • 120 x 144 Hi Resolution, Bit Image Graphics • 240 x 144 Ultra Hi Resolution, Bit Image Graphics
**CHARACTER SETS**—96 Standard ASCII Characters • 96 Italics • 64 Special Characters • 32 Block Graphic Characters • 96 Downloadable Characters • Super and Sub Script
**LINE SPACING**—Programmable by n/144″
**PAPER HANDLING**—Roll Paper • Cut Sheet • Tractor Fanfold • Copies: 3 Carbonless Sheets

**COMPLETE SYSTEM**
***NOTHING MORE TO BUY***

- 180 DAY WARRANTY
- BLUE STREAK INTERFACE
- SCREEN DUMP SOFTWARE

**319⁹⁵** + $10 Shipping and Insurance
15X System 439⁹⁵

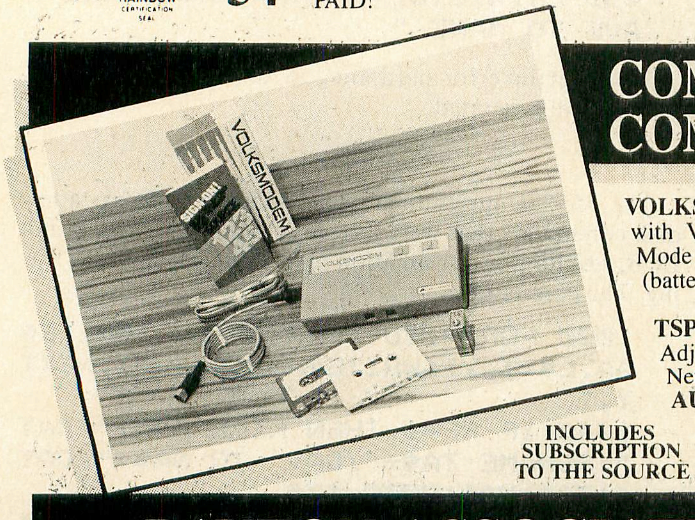


## BLUE STREAK
### SERIAL TO PARALLEL INTERFACE

- RUN COCO I or II to PARALLEL PRINTER
- 300, 600, 1200, 2400, 4800, 9600 SWITCHABLE BAUD RATES
- AC POWER OPTIONAL—NOT NEEDED WITH GEMINI PRINTER
- COMPLETE WITH **ALL** CABLES AND CONNECTORS
- 180 DAY WARRANTY

RAINBOW CERTIFICATION SEAL

**54⁹⁵** SHIPPING PAID!



## COMPLETE DATA COMMUNICATIONS PACKAGE

**VOLKSMODEM™**—Connects Directly to Wall Phone Jack • Telephone Jack with Voice/Data Switch • 300 Baud (bits per second) • Originate/Answer Mode Automatically Selected • Battery Powered, Low Drain for Long Life (batteries included) • Lifetime Warranty • Includes All Cables for COCO

**YOUR CHOICE OF SOFTWARE!**

**TSP (Terminal Software Package)**—51 x 24 Hi-Res Display • Buffer Auto Adjusts for 16K to 64K • Permits Communication to Virtually All BBS and Networks

**AUTOTERM™**—World's Smartest Terminal Program

INCLUDES SUBSCRIPTION TO THE SOURCE

**$79⁹⁵** + $2.00 Shipping with TSP

**$99⁹⁵** + $2.00 Shipping with AUTOTERM™

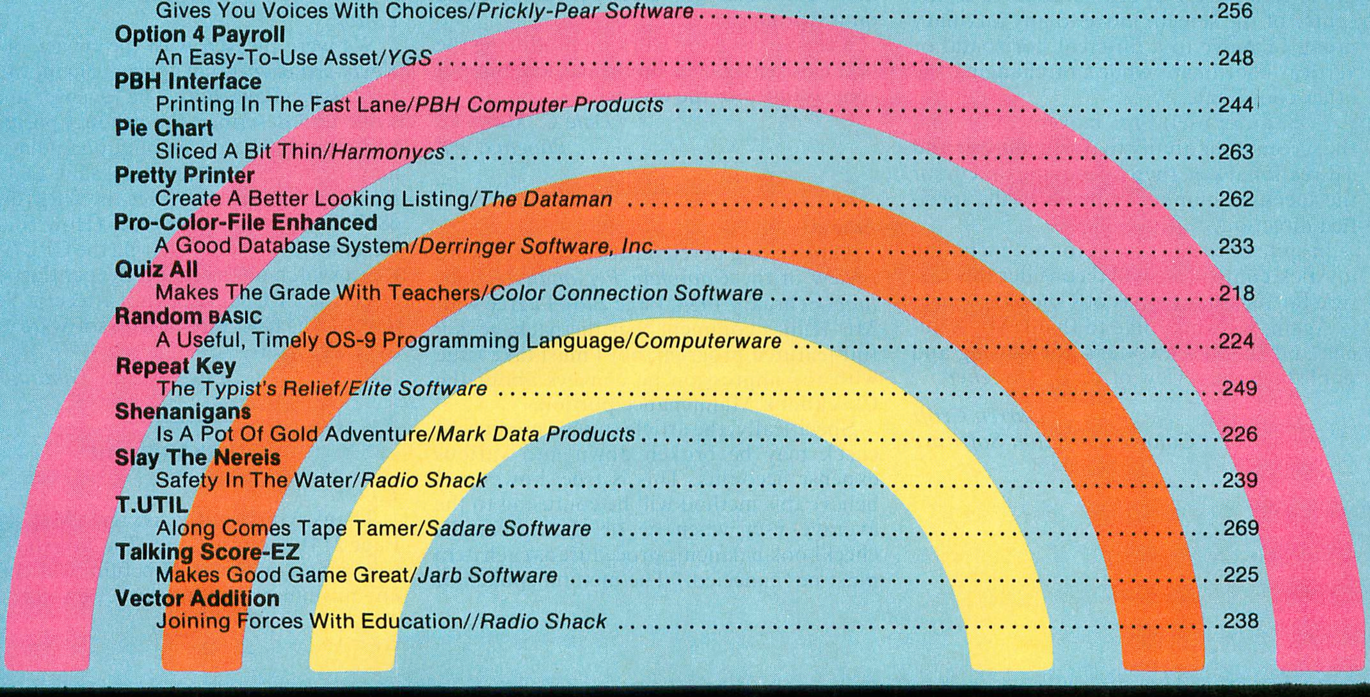
## DAYTON ASSOCIATES, INC.

OHIO CHARTER CORPORATION • DUN & BRADSTREET LISTED
7201 CLAIRCREST BLDG. C • DAYTON, OHIO 45424
(513) 236-1454
OHIO RESIDENTS ADD 6% SALES TAX
C.O.D. ADD $2.00

**FREE**
**TECHNICAL SUPPORT WHEN YOU NEED IT**
DAYTON ASSOCIATES CUSTOMERS ONLY

# RAINBOW REVIEWS

**Assembler Math**
Gets You Off To A Good Start/*Rainbow Connection Software* .......... 225
**Bible Stories Adventure**
An Exciting Old Testament Tour/*Sugar Software* .......... 230
**Business Manager**
Accounting For A Very Small Business/*80 Custom Software* .......... 242
**C-III**
Program Transfer Made Easy/*MichTron* .......... 258
**Disk Dump/Patch Utility**
Two Patches In One/*Silicon Rainbow Products* .......... 272
**Disktype**
A 'Do-Little' Program/*Sunshine Software* .......... 247
**Electronic Graph**
Math Functions In *PMODE4/Valhalla Enterprises* .......... 271
**Espionage Island**
Adventure For The Advanced And Beginner/*Owls Nest Software* .......... 228
**Estimate**
Provides Practice In Neglected Skill Area/*Tom Mix Software* .......... 234
**Fractions Tutor**
Half The Work, Four Times The Fun/*Computer Island* .......... 270
**Fundfile* Enhanced**
An Easy-To-Understand Investment System/*Parsons Software* .......... 232
**Gemini-10X Printer**
First Rate Features, Low Price/*Spectrum Projects* .......... 265
**Girdle The Enemy**
No Frills Fun/*Microcom Software* .......... 247
**GRAFPLOT 1.1**
A Great Package Gets Better/*Hawkes Research Services* .......... 220
**Here Comes De Prez**
Is Realistic Political Simulation/*Pal Creations* .......... 222
**J-Cat Modem**
A Low-Cost, Auto-Answer Solution/*Spectrum Projects* .......... 261
**Keep Text II**
A High Quality Word Processor/*P&M Software* .......... 264
**Kids' Choice And Early Letter Recognition**
Good Educational Fun/*Software Specialists* .......... 240
**Lunar Rover Patrol**
Has Arcade Qualities/*Spectral Associates* .......... 236
**Memo Minder**
It's A Record Maker/*Merrick & Co.* .......... 254
**Micromon**
MC-10 Monitor Has Desirable Features/*Micro Ten Software* .......... 260
**Morse Code Tutor/Teacher**
Patient Tutors/*Cynwyn* .......... 250
**Music Box**
Gives You Voices With Choices/*Prickly-Pear Software* .......... 256
**Option 4 Payroll**
An Easy-To-Use Asset/*YGS* .......... 248
**PBH Interface**
Printing In The Fast Lane/*PBH Computer Products* .......... 244
**Pie Chart**
Sliced A Bit Thin/*Harmonycs* .......... 263
**Pretty Printer**
Create A Better Looking Listing/*The Dataman* .......... 262
**Pro-Color-File Enhanced**
A Good Database System/*Derringer Software, Inc.* .......... 233
**Quiz All**
Makes The Grade With Teachers/*Color Connection Software* .......... 218
**Random BASIC**
A Useful, Timely OS-9 Programming Language/*Computerware* .......... 224
**Repeat Key**
The Typist's Relief/*Elite Software* .......... 249
**Shenanigans**
Is A Pot Of Gold Adventure/*Mark Data Products* .......... 226
**Slay The Nereis**
Safety In The Water/*Radio Shack* .......... 239
**T.UTIL**
Along Comes Tape Tamer/*Sadare Software* .......... 269
**Talking Score-EZ**
Makes Good Game Great/*Jarb Software* .......... 225
**Vector Addition**
Joining Forces With Education//*Radio Shack* .......... 238



# *reviewing* REVIEWS

### COLOR DESIGNER

*Editor:*

We would like to thank Tom Szlucha for his fine review of the *Color Designer* (April 1984, Page 245). This review was relatively complete and fair, both to us and our customers, and we would like to compliment THE RAINBOW and Mr. Szlucha for a job well done. We would, however, like to answer some questions brought up concerning the speed of the cursor and the use of a joystick in the program.

We must admit that with the two large cursor sizes, movement is not as rapid as might be desired. However, it is not so slow as to be annoying. In addition, the small cursor size is quite fast, and being the most commonly used size cursor, speed is generally not a problem while sketching with *Color Designer*.

To answer the question as to why joystick movement was not included in *Color Designer*, we must say that, yes, it is an intuitively obvious addition, and we did consider it. However, due to the fact that all commands are executed from the keyboard, we felt that it would be awkward to constantly be switching between joystick and keyboard. In addition, accuracy is very hard to achieve with the standard joystick (as any game player can attest to) and so it becomes frustrating trying to draw with a joystick.

We included a *MOVE* command that will move to any X,Y coordinate, move to the center of the screen, move to any auxiliary point, or move to a different horizontal or vertical coordinate while not changing the other coordinate.

Even more useful for movement around the screen is the ability to type a number and a directional key, thereby moving the cursor the specified number of pixels in the specified direction.

In spite of these reasons for not including joystick control, we will reconsider this feature for future revisions of *Color Designer*.

Again, we would like to thank Mr. Szlucha and the THE RAINBOW for writing and publishing the review of *Color Designer*.

*Darren Croft*
*Color Connection Software*

### COMPLETE PERSONAL ACCOUNTANT

*Editor:*

The February issue of THE RAINBOW had a review of *The Complete Personal Accountant* on Page 246 by Michael K. Hunt. I read the review several times and was quite impressed with the product through Michael's review. He did point out that there were some minor drawbacks but it seemed the big problem was that the manual was in a spiral ring notebook fashion rather than bound neatly in a solid binding. That to me is not as much a problem as it is an inconvenience.

I felt that I could live with their manual so I bought the product.

After entering checks and balancing my accounts, etc., I found that *CPA* does not support checks that are outstanding. I even made a long distance call to Programmers Institute who wrote *CPA* and was told that the Atari and the Commodore versions do support outstanding checks, the Color Computer does not. Needless to say, I was very disappointed in my choice but was more disappointed in Michael's review. I feel that if he would have paid closer attention to the product rather than the packaging, I and possibly others may have taken a route different from the *CPA*.

One other thing I found was that the program was written around the Line Printer VII and I had to go into the program and make some changes to have it run properly on my printer.

Keep up the good work on producing the best CoCo magazine on the market, but put some effort into the reviews.

*Dale C. Mihocko*
*Phoenix, AZ*

*Editor:*

I am writing in reference to your software review of the *Complete Personal Accountant* (February 1984, Page 246). I agree with Mr. Hunt's comment that the package is a full-featured program, but I must take issue with the impression he conveys about the Checkbook Maintenance portion.

Specifically, the article states a credit card check may be broken down into various expense accounts. This is true, however, I believe this method will be confusing to the average user when he or she enters the checkbook balancing procedure as each item must be "canceled." The method spoken of would require the check itself not being canceled and each of its component parts being canceled, to ensure proper assignment to expense accounts. A more accurate method will involve treating the credit card as another "checking" account and transferring appropriate monies to the account for disbursements.

In the same area, transferring funds between checking accounts and checking and cash will require the funds to pass through a third account, to avoid doubling of the entry. As you can see, anyone with numerous credit cards, household plus individual checking accounts and cash disbursements must maintain an equal number of files. At the same time, passing funds through a third account while keeping track of the numerous debits and credits can become rather involved.

I am not quite as "high" on the *Complete Personal Accountant* as Mr. Hunt and I don't feel the documentation is as easily followed as he states.

All in all, when you approach the $100 price range, I feel there should be programs available that interact more simply, although I have no idea how one "shops" for such an item.

*William C. Rumney*
*Baltimore, MD*

### KEYBOARD BEEPER

*Editor:*

We were pleased with the review of our *Keyboard Beeper* that appeared in the March 1984 issue (Page 244). The reviewer understood and described the product positively and clearly. There was only one point that may need clarification. He said that the Reset switch did not reset the CPU or the 6847. This is not quite true. (How could a Reset work without resetting the CPU?) The Reset switch on the Krikit Beeper Cartridge resets the CPU, but does not affect the SAM (6883). The 6847 is reset with software when the CPU resets.

*Eng Systems Laboratories*

### THE INVESTOR

*Editor:*

Thank you for the review (May 1984, Page 214) of our product *The Investor*. The following comments hopefully will correct any misinterpretations the review may convey to non-users of our product.

*The Investor* is a portfolio-performance, not a tax-lot accounting system. The cost of specific shares being sold must be determined from original purchase records before input. An investor must keep these records for the IRS. This will alleviate any inconvenience.

Users do not need to guess system defaults. If users simply enter responses exactly as prompted (e.g., Y or N for "IS DATA CORRECT [Y/N]"), then there are absolutely no problems.

Users never need to BREAK except to end the program. As the reviewer indicated, simply select DELETE to kill a record.

If one has more than one transaction for a stock with the same date, one may locate the second record to CHANGE or DELETE by temporarily changing the INVESTMENT CODE or TRAN DATE of the first and then locating the second.

To properly calculate portfolio total return, all distributions should be input as dividends, and short term capital gains distributions are considered dividends for tax purposes.

The reviewer must have gone to extremes to "beat" the system! We believe our error traps are extensive, i.e., investment codes are range checked, transaction codes are validity checked, month and day are range checked, and share prices, transaction dollar and share amounts are recalculated and crossfooted to within one one-thousandth of a share to ensure that all three variables are entered correctly.

*The Investor* is designed for people with modest computer resources but maybe not so modest portfolios. J&A Enterprises welcomes constructive criticism from all its users. We answer all questions promptly and courteously, continually improve our products in response to the investment needs of our customers at large, provide new releases of our software to our existing client base at cost, and stand by our products and users 100 percent.

*Robert Keay*
*J&A Enterprises*

### *Our Reviewer Responds*

*Editor:*

I'm sure I am not the only computer user who prefers to use the big, easy to reach ENTER key in preference to the 'Y' or 'N'. When I pressed ENTER, I was then prompted, I thought, to enter the next record. As it turned out, I thought wrong. I was actually being prompted to re-enter the previous record. In effect, the default response was 'N' for no. Instead of making me find out the hard way, you could have said, "IS DATA CORRECT (Y/N) (CR=N)." Or you could have used an *INKEY* routine so that the ENTER key would have no effect.

I noted that in order to change or delete a record which follows another transaction on the same date, the first one must apparently be deleted. Since changing a record is such a chore, I can't see that changing the first one and then changing it back again is a practical alternative.

Any distribution of capital gains from a mutual fund (as opposed to a gain on a sale of shares) is considered a long-term gain regardless of how long one has been a shareholder in the fund. It is definitely not a dividend.

I commend you on your committment to "answer questions promptly and courteously" and "stand by users 100 percent." I have had a bad experience with another software house that unfortunately does not share your user-friendly attitude. We need more like you.

*Neil Edward Parks*
*Beachwood, OH*

### AIR TRAFFIC CONTROLLER

*Editor:*

I can appreciate David Johnson's enjoyment of *Air Traffic Controller* "as a pilot." (Reviewed April 1984, Page 247.) However, as an air traffic controller, I do not enjoy that same enthusiasm.

When I saw the beginning screen I thought this was going to be very realistic. Much to my displeasure it was not at all. First of all, the controlling of flight data by the use of the joysticks is very slow, causing time penalties on your scoring. This could have been accomplished much faster and more realistically with keyboard entry. For example, all of the aircraft, either inbound or outbound, would have ID numbers alongside (just like the real radar) and all that would be required of the would-be controller is to push, let's say 'I' for "Input," then 123 for aircraft number, then 'A' for altitude, or 'S' for speed or 'H' for heading, then the appropriate input followed by ENTER.

Next, the aircraft are RPV (remotely piloted vehicles), which is okay except this is their excuse for their inability to turn 180 degrees instantly. They have no true turn rate at all. Oh, how many controllers would love to get an aircraft to make an instant turn like that, or for that matter, be able to change altitude from 9,000 feet to 1,000 feet instantly, right through any other aircraft without any danger or penalty.

That brings us to Mr. Johnson's favorite part, the landing of the aircraft. This is something that is not realistic at all in view of the fact that this is supposed to be an ATC simulation and not a flight simulation. The controller cannot land the aircraft for the pilot (as much as some may like to). He has his hands full as it is. Nonetheless, as a flight simulator, I found it to be quite jumpy in comparison to other flight simulators I have used.

Last of all, and probably least important to others, is the picture on the documentation and in the ad. Air traffic controller is a proud profession. Maybe if less people thought of us as the one in that picture, fewer would have walked off their job in August of 1981.

I feel that much of this could easily have been corrected with a better understanding of the real ATC environment or at least having some input from controllers. Another thing which would have helped would have been to write the program in machine language to utilize the CoCo's real power and speed.

*Danny R. Woodfin*
*Williamstown, WV*

### NUMBER-KRUNCHER

*Editor:*

[This letter is in reference to *Number-Kruncher* which was reviewed in May 1984, Page 232.] First, in our opinion, the reviewer overlooks the ability to place the window *anywhere* on the screen simultaneously with a main program display. The window is removed from the main display as the routine is exited (via the [Q]UIT command). Instructions to modify, append and call the subroutine are included.

Secondly, this MBA has yet to encounter a need for exponential and trigonometric functions in finance.

Lastly, Mr. Finkel could calculate his tax in the following manner:

TAX = INCOME * 2.20 * .01

This simply requires adding the keystrokes 'X' and '1'.

*N. Preisser*
*Moonshot Acres Software*

### INVESTIGATIONS IN INTEGRAL CALCULUS

*Editor:*

The review on *Investigations in Integral Calculus* on Page 242 of the April 1984 RAINBOW contains several serious errors.

The statements ". . the number of intervals. The last determines the accuracy of the calculations" and ". . . naturally the larger the number of intervals the more accurate the approximation" are popular misconceptions but they are misconceptions. See any textbook on numerical methods which deals with errors.

The trapezoidal rule may be good for explaining the method of numerical integration, but it is a third-rate method of numerical integration. The Romberg method gives the trapezoidal method as well as higher order methods for very little added complexity.

On Page 167 of the same magazine there is an advertisement for *Introduction to Numerical Methods*. Does this book make the same mistakes as those listed above? I doubt it.

*Charles C. Worstell, Ph.D.*
*Auburn, WA*

# RECEIVED & CERTIFIED

The following products recently have been received by THE RAINBOW, examined by our magazine staff and approved for the *Rainbow Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be. This month the *Seal of Certification* has been issued to:

**Retirement Planning Model**, a 16K ECB program which helps you organize your present assets, and projects these assets to their value at the retirement age you select. Using your assets at retirement is conducted for each year of your retirement. Each analysis stops when you either run out of funds or reach the age of 100. The model is designed for "what if" analysis and optional printer output. A&P Software, P.O. Box 202, Glenview, IL 60025, tape $34,95, disk $39.95

**CoCo Console**, a heavy steel, close tolerance construction monitor stand (13-inch monitor standard — 19-inch deluxe). Features ROM port accessibility including multipack interface; full flow integral cooling fan; front operated power and Reset switches; on/off indicator lamp; front mounted RS-232 splitter switch with rear mounted sockets; hi-tech scratch resistant powder paint finish, etc. AE Co., 5050 W. Mercer, Glendale, AZ 85304, standard $139, deluxe $149, introductory prices for limited time $119 and $129

**Skeet**, a 32K ECB structured and commented game program that teaches familiarity with the keyboard. All keys (except arrows and BREAK) are provided in *PMODE3* graphics. There are 12 selectable levels, each with four action speeds, which allow a player to systematically increase the difficulty of this teaching game, or to provide handicapping for players with different typing skills. Each game is three minutes long, during which time you must fire at the "clay pigeon" by pressing the appropriate key(s). CAN-COCO Software, P.O. Box 2914, Medley, Alberta, Canada T0A 2M0, $19.95

**Adventure Cracker™**, an ML program which looks into the CoCo's memory for words without finding garbage. Find those keywords in your favorite program which are locked away in the computer's memory. The program finds all ASCII words in memory from addresses 1536 to 32767. Useful for finding keywords in Adventure games. Classical Computing, P.O. Box 3318, Chapel Hill, NC 27515, tape $14.98

**Type Trek**, a 16K ECB program which is actually three games in one. There is a letter game, a word game and a sentence game. You are a member of the Federation of Planets, assigned to a distant outpost of the galaxy. Your job is to transmit vital Starfleet messages to your home planet. These messages are in codes so that Klingons and other enemies cannot understand them. Transmit these messages exactly as they are written and rise in your rank. There are 13 "ranks" (levels) based on key masters. Select long, medium or short games. Displays scoreboard and can be played with one or two players. CoCo Chips, 92 Acorn Circle, Oxford, OH 45056, tape $19.95, disk $22.95

**COCOINDEX**, a comprehensive listing of articles, stories, equipment reviews, and other items of interest to the CoCo owner. It is sectioned by year and sorted in two manners — by date with secondary field sorts done by magazine name and page number; and on a primary field by type and secondary fields of date and magazine. COCOINDEX, P.O. Box 23654, Tempe, AZ 85282, $19.95

**WordPro 70**, a word processing program for the Color Computer. Features include justification, centering and Hi-Res screen editing. Cost Plus Advertising, P.O. Box 6467, Corpus Christi, TX 78411; 16K cassette $39.95, 32/64K cassette $49.95, 64K disk $59.95 (a $15 discount applies for a limited time)

**The Creative TRS-80**, a reference guide for the TRS-80 owner. It contains articles, columns, reviews and tutorials written by leading programmers and reviewers. Topics covered include: hardware, software, graphics, music programming tips, word processing, and education. Creative Computing Press, One Park Ave., New York, NY 10016, $15.95

**Musical Strings**, a tutorial that stimulates musical creativity and teaches basic computer string variable concepts. After an animated lesson about string variables and an introduction to the Extended BASIC *PLAY* statements, this program turns the keyboard into a piano and lets you create your own musical strings to add to your favorite programs or to simply listen to: Creative Technical Consultants, P.O. Box 652, Cedar Crest, NM 87008, $17.95

**Disk VIDTEX Executive**, a smart terminal program for the Color Computer. Features auto log-on, downloading and uploading (including the CIS "B" protocol), semigraphics and Hi-Res graphics displays, sound effects and other features. CompuServe, P.O. Box 20212, Columbus, OH 43220, $39.95

**Random BASIC CC9**, a BASIC interpreter for the 64K CoCo with OS-9. It is on ANSI standard BASIC with many new features and is compatible with the *Random BASIC* versions used on other operating systems. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, $75

**VersaMail**, a 64K ECB mailing list manager requiring at least one disk drive. Features include: over 800 names saving (more than 2500 names are possible with four drives); eight predefined address fields and up to 12 user-definable label fields; logical selection on any field for labels or screen display; user-definable label format with extra wide or extra long labels supported; and a mail merge feature which inserts mailing list data into a form letter and prints it automatically. Computerware, P.O. Box 668, Dept. N2, Encinitas, CA 92024, disk $39.95

**Blue Streak Printer Interface,** connects the CoCo or MC-10 to any parallel printer. Baud rates from 300 to 9600 are switch-selectable. Can be powered by most printers. Dayton Associates, 7201 Claircrest Bldg. C, Dayton, OH 45424, $54.95

**MSI Color Finance II**, maintains your financial records for home or small business. It will record checks and deposits for multiple checking accounts. Establishes financial goals and tracks your progress on a monthly and year-to-date basis. Print comprehensive reports showing monthly and year-to-date data from a simple expense account to a comprehensive trail showing your total net worth. Delker Electronics Inc., Sam Davis Rd., Smyrna, TN 37167, disk $69.95

**MSI DISK-UTIL**, a program which protects your programs and data files from over 90 percent of the normal disk I/O Errors by creating an extra copy of the disk directory on each of your diskettes. Display and change data in any location on disk. Organize your disks by assigning each a unique serial number. Comprehensive directory information gives additional data needed to effectively manage your disk files. Delker Electronics Inc., Sam Davis Rd., Smyrna, TN 37167, $19.95

**Master Design**, a 32K ECB program requiring at least one disk drive. This text designer and graphic editor, comes with a screen print routine and interfaces with the *Telewriter-64*. It has the ability to generate lettering in the graphics mode from size two to 32 in a wide range of styles. Lettering can be skinny, bold, textured, tall, drop shadow, raised shadow and in different thickness. It is also a graphics editor which takes full advantage of Hi-Res commands including *GET, PUT, CIRCLE, PCOPY*, etc. and utilizes a "two cursor" concept to allow quick formatting of boxes, lines and special patterns such as dot patterns for shading and diagonal, vertical or horizontal lines for creative backgrounds. Includes a 7-bit and 8-bit Hi-Res screen print routine. Derringer Software Inc., P.O. Box 5300, Florence, SC 29502, $34.95 plus $2 S/H

**Data Defender**, a locking diskette storage system which holds 70 mini-diskettes (5¼ inches). Includes a hinged lid, two built-in carrying handles, complete with interior dividers, two keys. Disk-Haven Products, P.O. Box 443, Cockeysville, MD 21030, $24.95 plus $2 S/H

**DMAGIC**, a multi-functional utility designed to aid in file management on the CoCo. It provides capability to single step through the disk directory and performs the following functions: page directory, load, kill (delete) copy, rename, drive change, etc. Dorison House Publishers, Inc., 824 Park Square Bldg., Boston, MA 02116, $21.95

**Filter Kit #1**, a set of specialized I/O filters for OS-9. D.P. Johnson, 7655 S.W. Cedarcrest St., Portland, OR 97223, $24.95

**Hacker's Kit #1**, a set of OS-9 utility programs including a disassembler and other tools. D.P. Johnson, 7655 S.W. Cedarcrest St., Portland, OR 97223, $24.95

**SDISK+BOOTFIX,** two OS-9 utilities. *SDISK* is a device driver that can be configured for a variety of disk drives. *BOOTFIX* creates bootable double-sided OS-9 diskettes. D.P. Johnson, 7655 S.W. Cedarcrest St., Portland, OR 97223, $29.95 for *SDISK* only, $35.95 for *SDISK+BOOTFIX*

**Video Reverser**, an integrated circuit and switch assembly that allows three display formats for the CoCo: reversed, reversed all capitals, and normal. Dynamic Electronics Inc., P.O. Box 896, Hartselle, AL 35640, $19.95

**DynaStar and DynaForm**, a word processor and document formatter for the Color Computer with OS-9 and O-PAK. *DynaStar* has numerous editing commands and printing features. Also *DynaSpell*, a spelling checker for use with *DynaStar*. Frank Hogg Laboratory, The Regency Tower, Suite 215, 770 James Street, Syracuse, NY 13203; *DynaStar/DynaForm*, $99.90, *DynaSpell*, $59.95

**TV/Monitor Stands** allow the TV or video monitor to sit over the CoCo. TS-1 supports a set up to 13 inches; TS-4 handles many 19-inch sets. Howard Medical, Box 2, Chicago, IL 60690, TS-1 $29.50, TS-4 $39.50

**TRS-80® Color Computer Interfacing, With Experiments,** a guide which provides the reader with a basic understanding of the inner structure and operation of the TRS-80 CoCo, its major LSI components, and its expansion capabilities. It explains the various features of the 6809E microprocessor —the central processing unit of the CoCo. This book presents six practical experiments in the final chapter designed to demonstrate the material presented in the preceding chapters. It also contains three appendixes of reference material covering number systems and computer arithmetic, a review of digital logic circuits, etc. Howard W. Sams & Co., Inc., 4300 West 62nd St., Indianapolis, IN 46268, $14.95

**Where's-It**, a 32K ECB menu-driven, disk directory index, database management program for the CoCo with at least one disk drive. It will maintain files containing up to 972 16-character records. Each record consists of an eight-character program name, three-character program extension, and an identifier of up to a maximum of five characters. Jarb Software, 1636 D Ave., Suite C, National City, CA 92050, disk $19.95

**Super-Bug**, a 16K relocatable machine code monitor designed and written for the CoCo. Features Hex and alphanumeric memory display and modify; character string search; memory test facility; up to 220 breakpoints; mini object code disassembler; 64K mode setup; decimal, Hex and ASCII code conversion routines, etc. Mark Data Products, 24001 Alicia Pkwy., #207, Mission Viejo, CA 92691, tape $29.95, disk $32.95

**Tut's Tomb**, an Adventure which leads you through the ancient, mystical tomb of the great Pharoah. Find the magical keys that lead to unbelievable treasures as you outmaneuver the dangerous creatures which slither and swarm through the passages. Your score will depend on the number of treasures you can collect and the length of time you survive. Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, tape $24.95, disk $27.95

**Printer's Devil**, a connection between your CoCo's RS-232 port, and any Centronics compatible parallel printer. It features switch-selectable Baud rates from 300 to 9,600 Baud and either seven- or eight-bit word lengths. You may plug a modem into the port provided, and switch between modem and printer (without cable swapping). MCSI Inc., 1800 West 91st Place, Suite 400, Kansas City, MO 64114, $79.95

**Cassette Label**, a 16K ECB program which can print five lines of information on pinfeed cassette labels. Includes auto centering features for each line of text and 24 free labels with each program. It uses special features of your printer for standard, expanded and condensed characters. Metric Industries, Department R, P.O. Box 42396, Cincinnati, OH 45242, $6.95

**Model 101 Interface,** a serial to parallel interface which works with any Centronics compatible printer including Radio Shack, TDP, Gemini, Epson, Gorilla and many others. Features six switch-selectable Baud rates (300 to 9,600), a power supply and a 90-day warranty. Metric Industries, Department R, P.O. Box 42396, Cincinnati, OH 45242, $54.95

**Model 102 RS-232-C Switcher**, switches all three data lines. Contains indicator lights which let you know your computer is on. The three-position switch has silver plated contacts for high reliability. Color-coded lights indicate switch position and color-coded labels for your printer, modem, etc. are supplied. Metric Industries, Department R., P.O. Box 42396, Cincinnati, OH 45242, $35.95

**Memo Minder**, stores unstructured records in a sequential file, either on tape or on disk. Reserved RAM space allows up to 200 records or 8,000 bytes in memory at any one time. Records are located by entering one or two search parameters in the form on key letters, words or phrases. The entire program is menu-driven and requires a minimum of 16K ECB. Merrick & Co., P.O. Box 73, Conifer, CO 80433, $9.95

**Time Bandit**, an arcade-type game based loosely on a game called Tutenkham. Mich-Tron, 1691 Eason, Pontiac, MI 48054, tape $27.95, disk $29.95

**File Cabinet**, a cassette-based data management system designed to operate with a minimum of 16K ECB and has a machine language sort. Create and maintain records like recipes, coupons, household inventory, financial records, etc. Create records containing up to five fields you define. Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363, $19.95

**Patti-Pak**, an ML action game similar to the Pac-Man arcade game. Runs in 16K with or without Extended BASIC. Petrocci Freelance Associates, 651 N. Houghton Rd., Tucson AZ 85748, cassette $21.95, disk $26.95

**Super Disk Utility**, a 32K tool to aid the experienced as well as the novice programmer. It contains many features for different purposes, including: disk zap, catalog of disk files, super directory, file dating, purging files, disk directory sort, and copy by file. Petrocci Freelance Associates, 651 N. Houghton Rd., Tucson, AZ 85748, disk $44.95

**Deluxe Leapfrog**, a 16K ECB game in which you safely hop your frog across a highway, river and into his docks. Includes a unique sound system which lets you choose the background music. Photographics Software, 114-41 Queens Blvd., Forest Hills, NY 11375, $21.95

**Erland**, a 32K ECB ML complex simulation game. You are running a small holding in old Ireland and must manage your land, sheep, army, markets, fishing fleets, taxes and many other factors while you try to rise in rank to become King or Queen. You may attack or be attacked by the other players and you will have to face the fact that there isn't enough land to go around, so you may have to take some away from someone else. It requires two to five players. Prickly-Pear Software, 8532 E. 24th St., Tucson, AZ 85710, tape $24.95, disk $29.95

Publisher's Clearance!

Official Version

Frogger

Leapin Lizards. Thousands sold at 24.95 $9^95

Avenger

Shoot'm up fun Reg sold at 24.95 $9^95

Scarfman

Eat em up Pac Man® Reg sold at 24.95 $9^95

Robot Attack

Robot, Robot, everywhere Reg sold at 19.95 $9^95

Happy Hurdler

Run fast and jump high. Reg. sold at 24.95 $9^95

Supplies Limited
603-924-9882

Carnival House
• 145 Grove Street
• Peterborough
• New Hampshire 03458
• 603-924-9882

**Travelin' Toad**, a 32K ECB Hi-Res arcade-type game. Control the toad with your four arrow keys and guide the toad across a multi-lane super highway. Help him hop across the canal from log to log and turtle back to turtle back. Bring the toad to safety in his game hole, but don't stay out in the sun too long and watch out for the nasty reptiles! Earn bonus points by saving Tulip Toad or eating insects. Prickly-Pear Software, 8532 E. 24th St., Tucson, AZ 85710, tape $24.95, disk $29.95

**SuperGuide™**, a precision molded card guide designed specifically to align and support XPNDR cards in the CoCo cartridge slot. Being plastic, it cannot harm your CoCo and the design also prevents foreign objects from entering the computer when the spring door is open. Robotic Microsystems, Box 30807, Seattle, WA 98103, $3.95 each

**Colorama BBS**, a bulletin board program for the 64K CoCo with one drive. Features downloading, uploading, online games and graphics. Spectrum Projects, 93-15 86th Dr., Woodhaven, NY 11421, $99.95 plus $3 S/H

**Novation J-Cat**, a direct-connect modem with auto-answer capability. The 300 Baud unit is compatible with AT&T 103J standards. Includes a special cable for the CoCo and MC-10. Spectrum Projects, 93-15 86th Dr., Woodhaven, NY 11421, $129.95 plus $3 S/H

**Gemini-10X**, a 120 cps printer with tractor and friction feed. It has bit-image graphics capability and is compatible with most Epson Graftrax-Plus features. Requires serial/parallel interface for CoCo or MC-10. Spectrum Projects, 93-15 86th Dr., Woodhaven, NY 11421, $299.95 plus $3 S/H

**Multi-Pak Crack**, a utility that will allow anyone with a multi-pack interface and disk system to save their ROM Pack contents right to disk, and add a modification that will allow them to run normally on a 64K CoCo. According to the documentation with this program, there is no danger of blowing the CPU by plugging in ROM pack with the computer on and there is no need to cover pins of the ROM pack with tape. Spectrum Projects, 93-15 86th Dr., P.O. Box 21272, Woodhaven, NY 11421, $24.95 plus $3 S/H

**SuperForth**, a disk program which allows programming in the FORTH language. Spectrum Projects, 93-15 86th Dr., P.O. Box 21272, Woodhaven, NY 11421, $39.95 plus $3 S/H

**Spell 'N Fix II**, an enhanced version of the original *Spell 'N Fix*. This program reads your text, fixes your mistakes, lets you look up the spelling of words in its dictionary file and lets you add words to the dictionary. It catches spelling errors and typos. This updated version now has full upper- and lowercase display, checks and fixes errors in one pass, and looks up words in dictionary while correcting. Star-Kits, P.O. Box 209, Mt. Kisco, NY 10549, (previously advertised at $69.29) now send contribution. Send a formatted disk along with a SASE and Star-Kits will copy the program onto the disk. After using it, send a contribution of what you think the program is worth.

**Programmers' Sketch Pad**, a chart showing text screen *PRINT* @ and graphics *SET* locations as well as semigraphics character codes. Syntactics, Redcrest, CA 95569, two cards $12

**Crystle Castles**, a 32K ECB game requiring two joysticks. Control Bently the bear as he runs through many castles picking up stones without getting caught by the enemy. ThunderVision Software, P.O. Box 30012, Grand Junction, CO 81503, disk $29.95, tape $24.95

**EDITTRON**, a 16K ECB ML full-screen text editor for BASIC programs. It features 10 cursor-control functions that allow you to move freely within your BASIC program text. In addition, 10 time-saving screen editing functions including a built-in auto-line numbering utility are available. VIDTRON, 4418 E. Chapman Ave., Suite 284, Orange, CA 92669, tape $35, disk $40

**LIZPACK Statistical Analysis System**, an interactive statistical package for the Color Computer. *LIZPACK* has 88 statistical and file management programs. William J. Gray, 86 Cherokee Shores, Northport, AL 35476, $200 plus $5 S/H

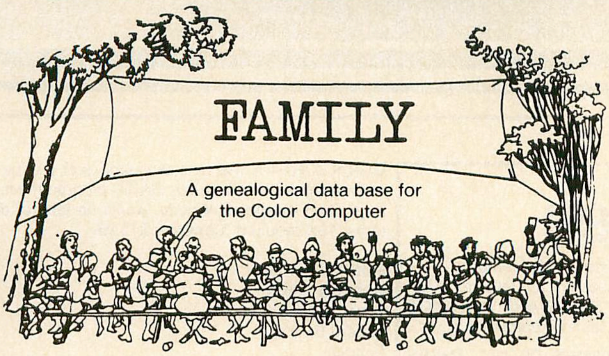
**Option 1**, a 32K ECB cash disbursement program. Features formatted screens, keyboard error trapping, total cost allocations, automatic discount calculations, prints checks with detailed stubs, batched/single checks, screen or print records, on-screen help guide, and media transfers. YGS, P.O. Box 208, Brechin, Ontario, L0K 1B0, Canada, $69.95

**Option 2**, a 64K ECB pay journal requiring a single disk drive. This program totals all expenses by category, sorts/views by check number and payee, total expense by selection, calculates total deductions and remissions, totals administrative/shop average hourly cost and gives a pay summary by month or year. YGS, P.O. Box 208 Brechin, Ontario, L0K 1B0 Canada, disk $49.95

The *Seal of Certification* program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in THE RAINBOW. By awarding a *Seal*, the magazine certifies the program *does exist*, but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW's reviewers for evaluation.

**— Susan Remini**

# PETROCCI FREELANCE ASSOCIATES


FAMILY
A genealogical data base for the Color Computer

Maintains data on 255 people in first eight generations of your family tree. Prints 3 charts; 5 generation pedigree - graphic display of lineage; Family group charts; ancestors by reference number. Easy to use.

32K EXT ........................................ 14.95

## ALPHABET SONG

An excellent companion to preschool package.

What better way to teach the alphabet than with a familiar tune accompanied by full size screen display of the letters. This one has been kid tested and loved!

Level 1 - sequences through entire alphabet with song.
Level 2 - -steps at random letters, child must press next letter in sequence
Level 3 - Child must enter each letter in order.
All levels accompanied by Alphabet Song.

16K EXT ........................................ 11.95

See Special Prices Below

## SPRING SPECIAL ALL GAMES REDUCED 30%

Good Through May 30, 1984

- **INSPECTOR CLUESEAU**
  The No. 1 Murder Mystery for the CoCo!
  *(Every game is different.) 32K EXT ........ 13.95*
- **PATTI-PAK**
  "The Best" - Highest Quality Graphics
  16K ........................................ 15.95
- **STAGECOACH**
  Wild West Adventure! 16K EXT ............ 13.95
- **FLASHER**
  Can Your Memory Save You From The Sharks?
  32K EXT ........................................ 13.95
- **TYCOON**
  CoCo Monopoly. 32K Tape Only .......... 13.95
- **BOWLER**
  Sports Action Fun! 16K EXT .............. 13.95
- **DUNKA DUCK**
  Arcade Action For All Ages. 16K EXT ..... 13.95

## BOWLING SECRETARY

*(New Super Second Edition)*

Now includes handicap routines for both men and women, pin spotting, selection of up to 15 players per team, plus the standard team standings, individual average, high and total pins, team won/lost, high series, cumulative total team points.

Printer Output & Screen Display

32K EXT - 24.95 Std. 16K Version Still Available

## LITTLE LEAGUER

Does all the record keeping for you. Excellent printout. Allows mid season entry. Keeps 19 different statistics and individual as well as team statistics.

Easy screen editing features - allows editing of single player data. Saves to tape or disk.

32K EXT ........................... 24.95

**Statistical Analysis**
32K EXT 2 Programs for 34.95
**Stress Evaluator**
16K EXT .............. 24.95
**Medical Terminology**
32K EXT .............. 19.95
**Heart Lung Circulatory**
32K EXT .............. 34.95
**Weather Forecaster**
32K EXT DISK ......... 19.95
**Weather Watch**
16K EXT .............. 24.95
**Hurricane Tracker**
16K EXT .............. 15.95
**Print Spooler**
64K .................. 11.95

**Master Graphics Tool Kit**
32K EXT .............. 39.95

**Text Master Graphics**
32K EXT .............. 19.95

All Programs 16K Tape
Unless Otherwise Specified
All Programs Available on Disk - Add $5.00
Special Sale Prices - Retail Only

Include $1.50 for handling for each program.
Arizona residents add 7% sales tax.
Quantity Discounts to Dealers

PETROCCI FREELANCE ASSOCIATES
651 N. Houghton Rd
Tucson, AZ 85748
602-296-1041

**Super Disk Utility**
32K EXT DISK ......... 44.95
**Real Estate Investment**
16K EXT .............. 24.95
**Homeowner Selling Analysis**
16K EXT .............. 24.95
**Owner Financed Real Estate**
16K EXT .............. 24.95
**KIDS KORNER**
Preschool Package, ABCs, 123s, Shapes, Big-Bigger
All Four ............... 24.95
Guillotine Spelling Game 16K EXT .......... 9.95
Alphabet Song
16K EXT .............. 11.95

Skyline
MARKETING CORP

## QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

## OUR CUSTOMERS SOUND OFF FOR SKYLINE!

*I would like to express my appreciation to you for the excellent service provided by your company. . . . I was delighted to receive my shipment only one week after the phone order. Hats off to your shipping department.*

*Once again, thank you for your prompt and efficient service, and for providing such a great package at a good price.*

*D.S., Kentucky*

*. . . You might care to know that this order is repeat business. Recently, I purchased a NEC monitor package from your firm and I was very pleased with your fast service, the quality of merchandise and the ease of set-up.*

*Thanks again. Looking forward to doing more business with you in the future.*

*M.S., California*

*. . . I used the Skyline 64K Memory Upgrade Kit to improve my "D" board 16K Extended CoCo to its full potential. Since I get three of the four CoCo oriented magazines and borrow the fourth from a friend, I have seen all of the published 64K upgrade methods. None was as simple as the one provided by Skyline with its memory chips . . . had the upgrade up and running in half an hour . . .*

*H.G., Virginia*

## SOFTWARE

| | |
|---|---|
| Cheshire Cat | |
| Graphicom (64K disk) | $29.95 |
| Cognitec | |
| Telewriter 64 tape | $49.95 |
| Telewriter 64 disc | $59.95 |
| Custom Software Engineering | |
| Graphic screen print, specify printer | $ 9.95 |
| Eigen Systems | |
| Colorcomm/E, disk or cart. | $49.95 |
| Stripper | $ 7.95 |
| CCEAD | $ 6.95 |
| BASIC Aid cartridge | $34.95 |
| Micro Works | |
| Macro 80C Editor/Assembler | $99.95 |
| SDS 80C Editor/Assembler | $89.95 |

Skyline Software

**Super Stats**—The most powerful statistics program available for the CoCo/TDP. Multiple linear regression, forecasting, mean, standard deviation, correlation coefficients, covariance, F and t tests. Powerful data editing and manipulation abilities. Data plotting, Student t tail areas, Gaussian cumulative probability distributions, and more. Flexible I/O (screen or printer, tape or disk). Very good documentation. 16K extended BASIC. **Cassette $29.95.**

| | |
|---|---|
| Page Plus (improved doc) tape | $27.95 |
| Page Plus disk | $29.95 |
| Structured Macros | $19.95 |

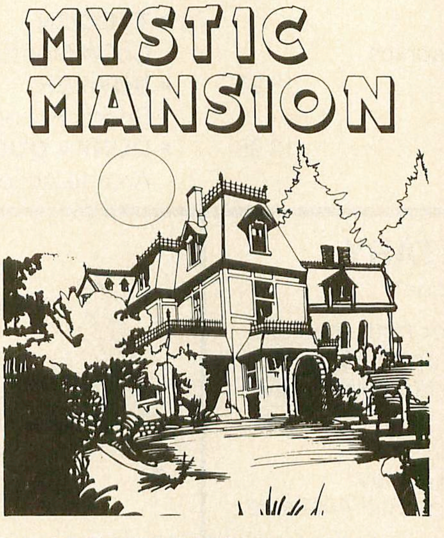
# C.C. Three

A powerful 'electronic spreadsheet', a full-featured word processor, and a flexible database—for an unheard of low price! This may be the **ONLY SOFTWARE PACKAGE YOU'LL EVER NEED TO BUY** for your computer.

**BOTH DISK AND TAPE VERSIONS OF ALL THREE PROGRAMS ARE INCLUDED** (on tape) for the bargain price of $49.95! No need to pay for upgrades to disk later! Over 40 pages of documentation in an attractive vinyl binder. C. C. Writer and C. C. File require 16K, C. C. Calc needs 32K. All require Extended Color **BASIC.** Order yours **NOW!**

| | |
|---|---|
| SETUP 64 | $19.95 |
| MDISK (source code included) | $27.95 |
| MDISK disk | $29.95 |

**ROMBACK**—Why pay more? The easiest to use ROM-pak dumping utility available! At the best price, tool comes with full documentation, including detailed patching instructions to allow several popular "problem" cartridges to run from tape or disk. 64K Extended BASIC. **Cassette $16.95.**



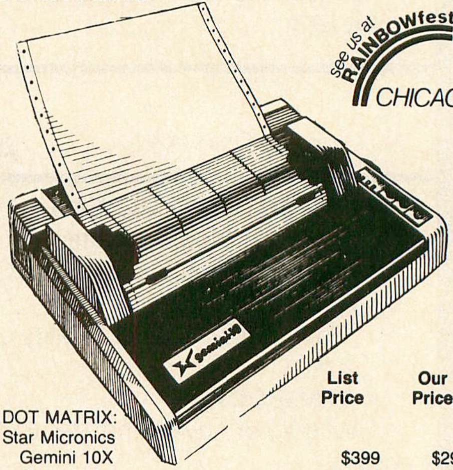
**Mystic Mansion**—New!! You'll be hearing lots about this incredible ALL GRAPHIC adventure. Explore the mansion and escape from the island, if you can! This one is tough to solve, but you'll have fun trying. For 32K disk only. **Disk $29.95**

**QUICKSORT**—A machine language sort routine specifically designed to be used by BASIC programmers. Written in position independent code, works on tape or disk systems. 16K required. **Cassette $12.95.**

| | |
|---|---|
| 64K BOOT/Paper | $19.95 |
| Wizard's Tomb | $12.95 |
| Wizard 64 tape | $21.95 |
| Wizard 64 disk | $23.95 |
| Simplex | $29.95 |
| C.C. File | $12.95 |
| C.C. Writer | $29.95 |
| C.C. Calc | $34.95 |
| C.C. Mailer | $19.95 |

## PRINTERS

see us at RAINBOWfest CHICAGO



| | List Price | Our Price |
|---|---|---|
| DOT MATRIX: | | |
| Star Micronics | | |
| Gemini 10X | $399 | $299 |
| Gemini 15x | $549 | $499 |
| Delta 10 | $649 | $449 |
| Delta 15 | $799 | $649 |
| Radix 10 | $849 | $695 |
| Radix 15 | $995 | $795 |
| NEC | | |
| PC-8023A | $599 | $399 |
| PC-8025 | $895 | $775 |
| Okidata Microline | | |
| 80 | $399 | $299 |
| 82A | $499 | $399 |
| 92P | $599 | $499 |
| 93P | $999 | $799 |
| DAISY WHEEL LETTER QUALITY: | | |
| Televideo (Juki) 6100 | $699 | $599 |
| NEC 15LQ | $695 | $595 |
| Star Power Type | $499 | $399 |
| Transtar 120P | $599 | $499 |
| 130P | $895 | $749 |
| BOTEK INTERFACE Required for Color Computer hookup to above printers | $69.95 | $69.95 |

**ORDERING INFORMATION**
***$10 shipping, handling, & insurance on printers.**
**Amdisk, and monitors. $5 on modems, $2 on all other orders.**
**All prices U.S. funds.**

**We Love Canadian Orders!**
**Inquire For Foreign Shipping**

**Dealer Inquiries Invited**

**Skyline Marketing Corp.**
**4510 W. Irving Park Rd.**
**Chicago, IL 60641**
**(312) 286-0762**

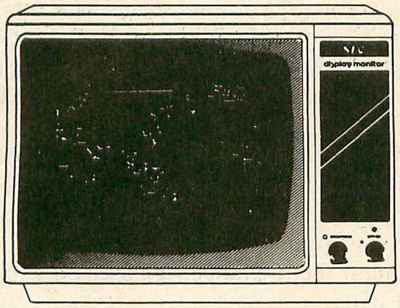
**MODEM ORDER LINE (312) 286-9015**

## QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

# $60 Software Bonus With Memory Upgrade

That's right—Skyline's famous 64K Upgrade is an even better deal than before! 8 guaranteed 200 n.s. 64K memory chips, solderless installation instructions (one solder connection required on Color Computer 2), Skyline's 64K BOOT and PAGER programs, PLUS the Wizard 64 adventure game, PLUS a handy new utility, SETUP64 (allows you to configure your tape or disk system in a myriad of ways)! Still only $59!! Order now—this offer may be withdrawn at any time!

## MONITORS

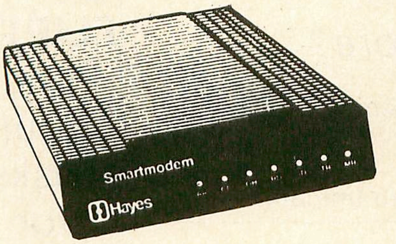


| | | |
|---|---|---|
| Amdek V30 12″ green | $179 | $139 |
| V300A 12″ amber | $199 | $159 |
| Color 1 Plus 12″ | $379 | $289 |
| NEC JB1260 12″ green | $149 | $129 |
| JB1205MA 12″ amber | $210 | $169 |
| JC1215 Color | $399 | $289 |
| Synco TM1200A 12″ amber | $150 | $ 98 |
| TM1200G 12″ green | $139 | $ 89 |

MONITOR ADAPTERS for Color Computer hookup—no soldering required.

| | | |
|---|---|---|
| For original Color Computer; color, monochrome & audio | $24.95 | $24.95 |
| For Color Computer II, mono & audio outputs | $26.95 | $26.95 |
| For Color Computer II, as above plus color video output | $39.95 | $39.95 |

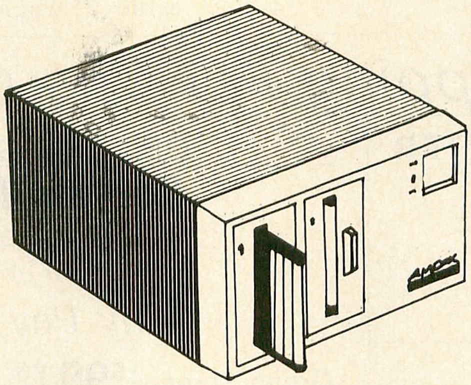
## MODEMS



| | | |
|---|---|---|
| Hayes | | |
| Stack Smartmodem 300 b | $289.00 | $229.00 |
| Stack Smartmodem 1200 b | $699.00 | $549.00 |
| Cable for Hayes | $19.95 | $14.95 |
| NEC | | |
| Authentic 300 MD (no extra cable needed, ready to plugin) | $79.95 | $64.95 |

## DISK DRIVES

| | | |
|---|---|---|
| Amdek IIIB 3″ dual drive with cable & 2 disks | $599 | $479 |



## MONTHLY SPECIALS!!

C.C. Three included FREE with any printer purchase! Graphicom included FREE with any video monitor purchase!

(This offer expires 6/30/84.)

## NOW AVAILABLE!

**Skyline's Risk-Free diskettes and data cassettes—so good that they're guaranteed for as long as you own them!**

Our single sided double density diskettes are certified 100% error-free, and meet or surpass every standard for accurate, reliable, long-life that can be applied to mini or microcomputer media. From the magnetic coating to the outside of the jacket, only the highest quality materials and production techniques are used. Diskettes are supplied in a ten-pack with Tyvek sleeves, a dozen color-coded labels, and 18 write-protect tabs for only $19.95. *See our guarantee below.*
**10 diskettes, sleeves, labels, and write protect tabs—$19.95**

Skyline's Risk-Free Data Cassettes are manufactured with the same attention to quality as our diskettes, and carry the same incredible guarantee! The professional grade 5-screw shells use stainless steel pins, flanged guide rollers, and phosphor bronze springs for long, reliable life. They are wound with AGFA PE 611/811 premium grade tape—the highest priced non-chrome tape available! One dozen C-10 tapes, 12 poly boxes, and 30 labels are value-priced at only $8.00!
*Order today.*
**12 data cassettes, boxes, and labels—$8.00**

## Skyline's "No Bull" Media Guarantee:

Skyline Marketing Corp. warrants that each Risk-Free diskette or data cassette sold shall be error free, and will remain that way for the life of the media.

If a diskette or data cassette EVER fails, immediate replacement will be made on receipt of the defective media and proof of purchase.

VISA

MasterCard

see us at RAINBOWfest CHICAGO

UPS C.O.D. orders gladly accepted, $2.00 additional.

Dept. R

**FREE GIFT**
Use of our order forms qualifies you for a free gift with your order. Get on our mailing list now for order forms.
**COUPON**

NAME ____________________
ADDRESS ____________________
CITY ____________ STATE ______ ZIP ______

# Teachers Will Find *Quiz All* Makes The Grade

Just when I think I have seen enough of "make and take a quiz" programs, along comes someone with a new idea. It just goes to show you that computer programming is limited only to your imagination! *Quiz All* is a menu-driven program for developing, taking or printing a quiz.

The program is user friendly and enjoyable for students to work with. The menu includes:

1) Create A Quiz
2) Load Quiz From Disk (or cassette)
3) Save Quiz From Disk (or cassette)
4) Study For The Quiz
5) Hardcopy Of Quiz
6) Take The Quiz!

The main menu is straightforward and concise. Each menu selection goes to a branch with further questions.

*Quiz All* quickly gets into the features that set it aside from other programs of this type. When you start with number 1, "Create a Quiz," you are asked "What Kind of Test Will This Be." You then have the choice of:

1) Letter By Letter Input
2) Computer Generated Multiple Choice
3) Teacher Generated Multiple Choice

Number 1, "Letter By Letter Input" is simple enough. The student has to answer the question with proper spelling. When I saw number 2, "Computer Generated Multiple Choice," I said to myself, "I know the Color Computer is a good machine, but the CoCo making up answers to multiple choice questions?" Sounded too good to be true. (Okay, I know true CoCo users feel that their machine can do anything, but there is a limit.) Delving into the program revealed that *Quiz All* has a unique feature that anyone who makes up multiple choice tests will really appreciate. If you are developing a test of similar questions, i.e., dates, presidents, flowers, etc., you only have to put in the question and the correct answer. Then, upon completion of the questions, the computer will use all the answers you gave to fill in the wrong answer blanks. So you get your questions with three random wrong answers plus your one correct answer. Of course, if you really want to input the four answers for each question, chose option number 3, "Teacher Generated Multiple Choice."

"Study For The Quiz" (main menu choice 4) lets you specify which question you want or a random selection of questions by the computer. "Study" means just that, the program shows you all questions and their answers.

"Take The Quiz!" (main menu choice 6) asks you what kind of test you would like:

0) Default Set When Created
1) Letter By Letter Input
2) Multiple Choice

Number 0 means that the quiz will be shown the way it was written. Formats for numbers 1 and 2 were explained earlier. (I would have preferred using numbers 1, 2, 3 —

One Stop Shopping For The Color Computer

**CoCo II MONITOR ADAPTER**
From
COMPUTERWARE
Monochrome $26.95
Color $39.95

**MICRONIX Super Pro Keyboard**
4 programmable function keys
*software included*
Fits CoCo II $79.95

**REITZ™ Serial to Parallel Converter**
Transfer Data to your Printer
at up to 9600 BAUD $59.95

*GET THE GORILLA!*
**Gorilla Monitor**
12" High resolution screen
*Amber or Green*
*Why Pay More?*
Green Screen $99.95 Amber $124.95

— DON'T BREAK! Communicate! —

NOVATION J-CAT Modem ............ $149.95
EIGEN Color COM/E ............ $ 49.95
Double Density Color Term + ............ $ 39.95
VIP Terminal ............ $ 49.95
Computerware Color Connection ............ $ 34.95

**ALL VIP PROGRAMS IN STOCK!**

**FLIPIT!**
Punch your Disks for double the storage
$9.95

**1-(800)-242-2626** (Outside Ohio) **1-(419)-537-1432** (Inside Ohio)

REITZ COMPUTER CENTER™
3170 W. Central Ave.
Westgate Meadows Shopping Center
Toledo. Ohio 43606
Please include phone number with all orders. Include $5.00 for all hardware orders and $2.00 for all software orders. Ohio residents please add 6% state sales tax.

minor preference.) You are then asked if you would like immediate grading of your answers, grading at the end of the quiz, or a combination of both. When going over the test, the program lists each question, your answer and the correct answer. In doing the test, when correct, you are given a very pleasing, machine language melody and a statement such as, "what a brain" or "smart person." There are a series of melodies and statements. If you are incorrect you receive a short negative sound and the word "wrong." Upon completion *Quiz All* gives the results. The "Results" are presented by stating, "Out of a possible of # questions, You answered # correctly, Leaving # answered incorrectly." I feel that the design, format and results, either positive or negative, of the quiz, are very pleasing and enjoyable to the taker. The quick melodies and comments make taking the test fun.

I was also very satisfied with the "Hardcopy" (main menu choice 5). Matter of fact, I was downright enthusiastic! You have your choice of either how you originally set up the test, a one word or short answer essay or multiple choice. *Fantastic!* Thus, it is not necessary to have typed in a multiple choice test in order to get a multiple choice test format — the program will set it up for you. *And* the printout is formatted with special student instructions, centered title, and spaced appropriately for the type of questions used. The program also can print out the answer key with answers listed by question number with answer, or questions printed out with correct answers.

A simple, but effective, editing system permits changing questions or answers by menu selection.

I did have one problem with *Quiz All*, though not with the software. I did not like the instruction booklet. There are eight single-spaced, double-sided pages. The booklet includes the table of contents, instructions, example section, and a glossary. I do not fault the author with not being clear and concise but rather with being too detailed. I felt that it was easier to learn how the program operated by *running it* than by reading the instructions. In addition, I objected to the first page of corrections, called "AMENDMENTS." The page begins with: "Due to the addition of some extra features to *Quiz All*, the instructions have a few discrepancies that need to be corrected." I do not object to corrections, but I feel that the instructions should be as simple as possible and that corrections should be done in the text and reprinted, not added on. I also did not like unnecessary comments in the directions. In the tape directions it states, "Rewind the tape if it isn't already." "Rewind the tape" would have been sufficient. I also did not feel it was necessary to go into a discussion of terminology of the words "teacher" and "student." The feeling I had was that the author was trying to get away from a "school" image. Please note that my objections to the instruction booklet are subjective feelings and in no way detract from my positive attitude towards *Quiz All*.

As a teacher constantly involved in making up tests, I found *Quiz All* to be an excellent program, not only for developing tests, but for taking them.

**(Color Connection Software, 1060 Buddlea Drive, Sandy, UT 84070, 16K/32K tape $18.95, disk $20.95)**

**— Michael F. Garozzo**

**Marymac INDUSTRIES, INC.**

In Texas, Orders,
Questions & Answers
1-713-392-0747

22511 Katy Freeway
Katy (Houston), Texas 77450

To Order
1-800-231-3680
800-231-3681

***SAVE BIG DOLLARS ON ALL TRS-80® HARDWARE & SOFTWARE***

TRS-80® by Radio Shack. Brand new in cartons delivered. Save state sales tax. Texas residents, add only 5% sales tax. Open Mon. - Fri., 9 - 6, Sat., 9 - 1. We pay freight and insurance. Come by and see us. Call us for a reference in or near your city. Ref: Farmers State Bank, Brookshire, Texas.

**WE OFFER ON REQUEST**

- Federal Express (overnight delivery) ☑
- Houston Intercontinental Airport Delivery, Same Day Service ☑
- U.P.S. BLUE—Every Day ☑
- References from people who have bought computers from us probably in your city. We have thousands of satisfied customers. WE WILL NOT BE UNDERSOLD! ☑

**ED McMANUS**

AMERICAN EXPRESS Cards Welcome

No Tax on Out of Texas Shipments!

**Save 10% 15% OR MORE**

**WE ALWAYS OFFER**

- ☑ We accept MasterCard, Visa and American Express cards
- ☑ We use Direct Freight lines. No long waits
- ☑ We always pay the freight and insurance
- ☑ Toll free order number
- ☑ Our capability to go to the giant TRS-80® Computer warehouse 5 hours away, in Ft. Worth, Texas, to keep *you* in stock.

® TRS-80 is a Registered Trademark of Tandy Corp.

**JOE McMANUS**

VISA

**TELEX: 77-4132 (FLEXS HOU)**

# *GRAFPLOT* — A Great Package Gets Better

By Frank J. Esser

The July 1983 issue of THE RAINBOW carried a review on *GRAFPLOT* Version 1.0. Since that time a few refinements have been added to what I consider a very good package, which only serve to make it better. First, a matter of review on the original package.

The original review which appeared in the July 1983 issue of THE RAINBOW was accurate, although it did not go into the detail I think the package needs. Thus, I would like to go back over some of the features that are offered by *GRAFPLOT* and then cover the latest set of additions.

*GRAFPLOT* is a program which allows the user to produce, either on the screen or on a printer, plots of one or two independent sets of data, against a common or singular set of data. For instance, suppose you would like to see a plotting of your income as a function of the calendar year. On the x-axis you would most likely plot the calendar year, and on the y-axis your income for those years in dollars. Perhaps also on the same graph you would like to see the percent of increase in income per year by each calendar year. Again on the x-axis you would plot the calendar year. On the y-axis you would plot the percent increase. But you already have your salary on the y-axis. No fear, *GRAFPLOT* will place one set of variables on the right side of the graph on the y-axis and the second set on the other side Both y-axes are independently labeled along with the type of point identifier that each will use when plotting the data. One set of point identifiers may be a square, a point, or the plus sign. Once the graph is defined, the data can be entered. There are three methods of data entry. You can perform an interactive form of data entry, read in a prepared data file from disk or tape, generate data from an equation, or read in a file prepared by another program from either disk or tape. Whichever way you choose, once the data is entered it can be displayed, edited or changed and redisplayed, then printed or saved again to disk or tape. If you have ever wanted a manner to prepare plots of data involving one dependent variable and two independent variables, then *GRAFPLOT* just may be the program for you. Some of the features are:

1) One dependent variable/two independent variables.
2) 200 data points per axis.
3) All three axes have neat labels.
4) All axes have tick marks with a range you set.
5) Active graph is 222 x 174 pixels.
6) Unique window allows you to blow up any portion of the graph for closer viewing.
7) Three graphing symbols/two line types.
8) Data can be chained to plot more than 200 points.
9) A data smoothing function to clean up messy data.
10) User-defined functions which allow you to plot any function that can be written in BASIC.
11) Built-in integration function which allows the calculation of the area under the curve or evaluation of the integrals of user-defined functions.
12) The program is completely menu-driven and easy to use.
13) Error checking is used extensively to help prevent the entry of erroneous data.
14) Single key responses are used wherever possible to reduce response time.

Now, with all this information in hand I suppose the next logical question might be, "What have the people at Hawkes Research done to improve such a program?" Well here they are:

1) Free screenprint program for Radio Shack dot-matrix printers.
2) Full 96-character ASCII set with real descenders in four on-screen labels.
3) Automatic scaling of graph axes for "hands off" generation of graphs.
4) Label and filename input checking.
5) Built-in interfacing for Custom Software Engineering Graphic Screenprint Program or any other machine language screen print program for non-RS printers.
6) Kill and rename files on disk under program control.

I would like to look at these improvements one at a time. On the disk with *GRAFPLOT* Version 1.1 are two programs, *SETUP* and *SCRPNT*. *SCRPNT* is the Radio Shack screen print routine. *SETUP* is a program which will take the Custom Software Engineering (or other) screen print program and relocate it and then make a copy of it on disk with the right load addresses. If you are using a Radio Shack printer, then you need to do nothing, but if you intend to use the CSE screen print program, or some other, then *SETUP* will walk you through all the steps necessary to get the program installed and ready for calling from *GRAF-*

FORMAKER

**CREATES THESE FORMS**

**Invoice** **Overdue Notice**
**Letter** **Receipt**
**Purchase Order** **Job Quote**
**Mail Order** **Order Confirmation**
**Payment Record**

and stores all the information on disk or tape for easy retrieval later. Figure list, net, discount, subtotals, freight, tax, etc. Extremely user friendly.

32K Disk **$29.00** (Freight Included)

**Easily customize it with your name, address, credit card #, tax rate & number and more.**

**Challenger Software**

3703 131st Ave. N.
Clearwater, FL 33520
or call **(813) 577-3998**

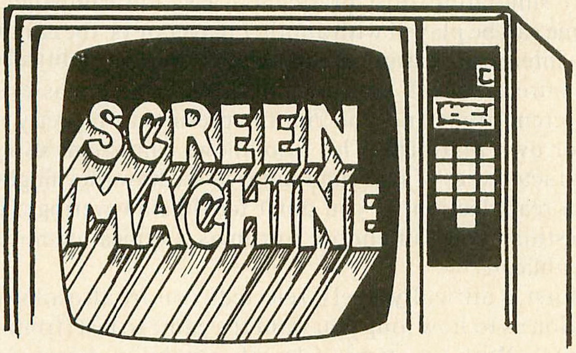
VISA MasterCard

*Call between 9 a.m.-5 p.m. EST*

*We'll mail you more information and a sample invoice.*

# GET WITH THE PROGRAM

## RAINBOW SCREEN MACHINE



The Rolls Royce of graphics/text screen enhancers — more features than all others combined!

- Add these features to your computer/program: ML extension of Basic loads on top of 16, 32, or 64K machines to enable easy mixture of hi-res graphics and text in your programs. Dense text or large lettering for children, visually impaired or VCR title screens with no programming!
- User definable 224 character set featuring lower case descenders, Greek, cars, tanks, planes, etc., completely interfaced with all keys, commands, and PMODES. 12 sizes (most colored) from 16x8 to 64x24.
- 2 distinct character sets automatically switch for sharpest lettering featuring underline, subscript, superscript, reverse video, top and bottom scroll protect, double width, colored characters in PMODE 4, and help screen.
- Includes demo program, character generator program and manual. 16K Ext. Basic required - 32K recommended, $29.95 Tape, $32.95 Disk.
- Super Screen Machine adds SMOOTH Scroll, Key Click, Break Disable, Screen Dump command and more. $44.95 Cass - $47.95 Disk.

RAINBOW
CERTIFICATION
SEAL

## 2⁷ 16³ AE5 .00 7FFF ASSEMBLER MATH

At last! A hi-res *graphics* tutorial that teaches the fundamental concepts of binary and hexadecimal *math so essential to assembly language programming on the Co Co.*

Sections include:
- Decimal to binary
- Binary to decimal
- Binary addition
- Binary subtraction
- Binary to hexadecimal
- Hexadecimal to decimal
- Decimal to hexadecimal

see us at RAINBOWfest CHICAGO

Includes demo and extensive manual
32K Extended Basic — $24.95 Cass - $27.95 Disk

## CONQUEST OF KZIRGLA & SCEPTER OF KZIRGLA

Dungeons, wizards, treasure chests, hidden trap doors and more. If you enjoy challenge and complexity, these adventure games are for you. Featuring real-time graphics with arcade sound for your color computer. "Scepter" requires 16K Extended Basic, $16.95 Cass - $19.95 Disk. Hi-res sequel "Conquest" 16K Extended Basic Cass $21.95; 32K Disk $24.95.

## Discover the Rainbow in your Color Computer!

RAINBOW
CONNECTION
SOFTWARE

**RAINBOW CONNECTION SOFTWARE**
3514 6th Place NW, Suite D
Rochester, MN 55901
507-288-4424

| ITEM | CASSETTE/DISK | PRICE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | Sub Total | |
| | Shipping | $2.00 |
| | Minnesota residents add 6% Sales Tax | |
| # | Visa & M. C. add 3% | |
| Exp | TOTAL | |

NAME
ADDRESS
CITY
STATE ZIP

Personal checks welcome - no delay.
Dealer inquiries invited.
Send SASE for catalog.

Not affiliated with
THE RAINBOW

MasterCard VISA

*PLOT.* I have a DMP-200 Radio Shack printer and the standard R/S routine supplied works perfectly. All characters that can be generated from the keyboard are allowed for use in the graph labels and will be printed on the screen. As labels are input, they are checked for length and will be truncated if too long. The new version gives you the option of printing the graph label on-screen, if one exists. *GRAFPLOT* will automatically calculate the minimum, maximum and tic interval for all the axes so that the data will be displayed with the maximum resolution that can be obtained. Each time you plot data, you will be asked if you want auto-scaling, if you say "NO" then you will be asked for the ranges for each of the axes to be plotted. Disk users can now kill and rename disk files from within the program. Disk filenames are checked for syntax errors to avoid most common I/O Errors. Since BASIC will erase old files with the same name as the new file, *GRAFPLOT* will stop before every disk writing and ask if you are sure before it goes on.

I found *GRAFPLOT* to be a program of good quality which I think does an excellent job of plotting data sets. You have the option of plotting already existing data or you can plot a defined user function by giving the range desired for the independent variable and *GRAEPLOT* will do the rest. The plots are done on a 220 by 174 pixel screen. I run a part-time business and had always wanted to plot income versus calendar year along with profit versus calendar year. It only took 10 minutes to get the data into *GRAFPLOT* and using the auto-ranging, the data was plotted with maximum resolution. The graphs were easy to read and looked very good when dumped to my DMP-200 printer. The documentation is clear and easy to use as is the program itself. I am totally impressed with the ease with which good results can be obtained.

I found only one drawback in the entire package. It appears that the screen dump program performs a one for one correspondence between pixel and printer dot. Thus, the resulting dump to the printer produced a graph which I thought was less than half the available size for a given printer. It would have been nice if the size could have been blown up during the printing process. But, perhaps for some reason unknown to the author it is just not possible. Anyway, that is all I could find wrong with what I really consider to be a very well done package.

I highly recommend *GRAFPLOT* to those who have a requirement to either display given functions over certain ranges, those who have data which they would like displayed and those who are just plain interested in doing some plotting on their own. The documentation is easy to read and the program is even easier to use. Hawkes Research is to be commended for the job they have done. If you are the owner of Version 1.0 you can exchange it for for the updated version for the trival sum of $3.

**(Hawkes Research Services, 1442 Sixth Street, Berkeley, CA 94710, $35 16K ECB tape, $40 32K ECB tape, and $45 32K ECB disk plus $3 S/H)**

---

*See You At*
**RAINBOWfest**
Chicago
June 22-24

# *Here Comes De Prez* Is Realistic Political Simulation

*Here Comes De Prez*, from Pal Creations, is a 32K BASIC text simulation of a presidential election campaign. The game can be played with another player or vs. the computer. An interesting feature in this simulation is the political questionaire, in which your own political views are assessed in different areas and you run for president on pretty much your own platform. This also allows campaigns using the characteristics of real candidates to see how they might fare in a real election. If you don't feel like answering a lot of questions you can choose to run as a typical democrat or republican.

First, a difficulty level is selected. You are also allowed an option as to how long you want the game to last (from 1 to 9 hours). With this type of length capability, I would have liked to see a game-save feature.

The simulation begins and the candidates are transported to their respective party's national convention (in correct 1984 locations) where vice-presidential candidates are selected. Then the campaign begins.

From here on you use essentially real campaign-type strategy to attempt to get elected. In each turn you may consult newspapers, commission voter polls in up to five states per turn or read voter polls commissioned in the previous turn. Based on this information you make travel plans for you and your vice-presidential candidate. At certain times you will decide to make speeches at some of your stops but choose your topic carefully to achieve maximum benefit.

Debates can occur when both players in a two-player game find themselves in the same state. The debates are interesting; a random number of up to 10 topics are selected by the candidates alternately. (Select your strength areas or your opponent's weak areas.)

Then the debate begins and as the computer moderates by presenting topics, the players press a key to indicate if they wish to take a stand on a particular topic. When both players take a stand on a topic the computer will "score" the candidates, briefly display the score and move on to the next topic. If you are getting stomped you can withdraw from the debate early to minimize damages.

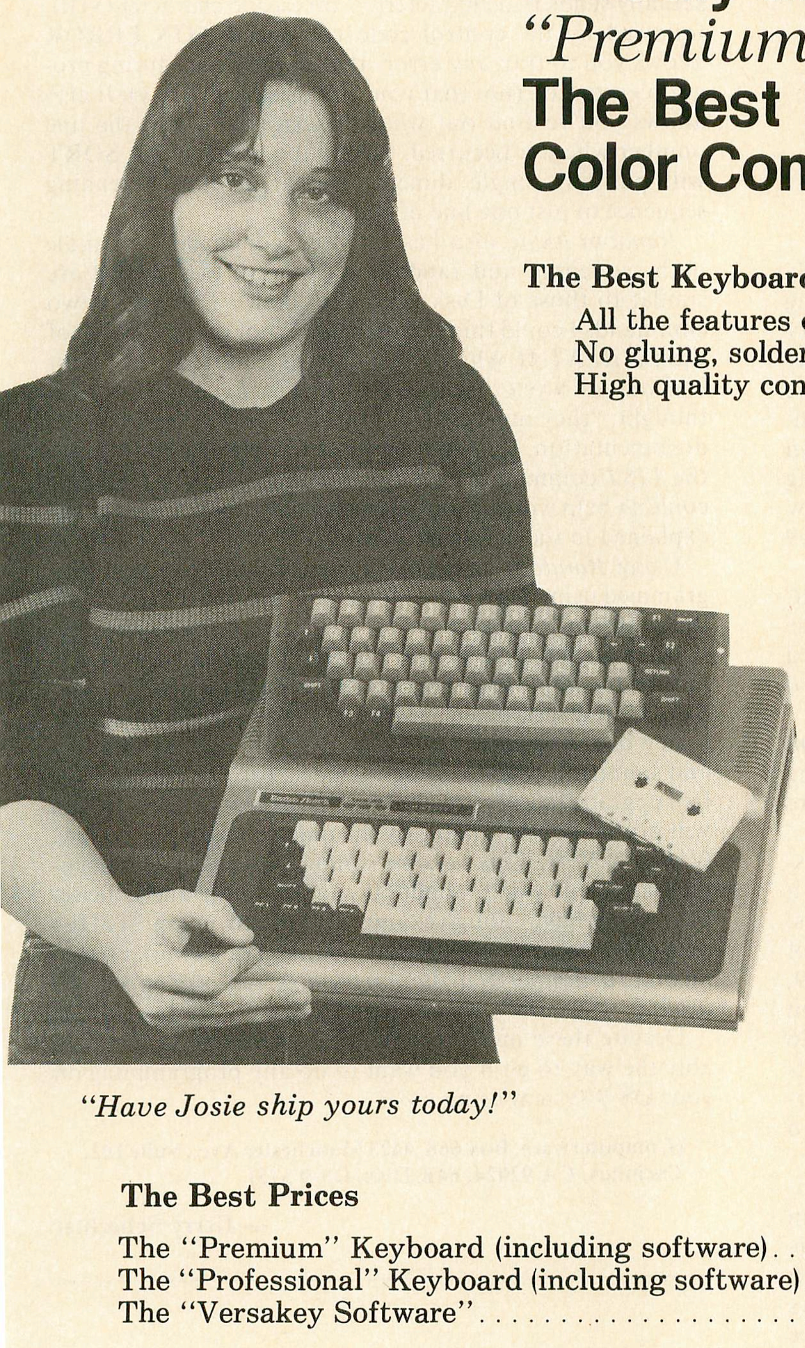
After the campaign is over, the program proceeds to the election display. Now you can sit back and watch the returns roll in (as reported by the network news teams). When a candidate is elected there is a rendition of "Hail to the Chief" and the game is over.

I enjoyed *Here Comes De Prez* because it's realistic. It requires thinking (and even a little note taking — you must keep up with who's strong or weak and where). At $14.95 it's a good buy.

**(Pal Creations, 10456 Amantha Ave., San Diego, CA 92126, tape $14.95)**

**— David Johnson**

# Macrotron**
# Proudly Introduces Our New *"Premium" Keyboard*— The Best For Your Color Computer



*"Have Josie ship yours today!"*

**The Best Keyboard**

All the features of our popular PROFESSIONAL KEYBOARD:
No gluing, soldering, or cutting—plugs right in.
High quality construction assures years of trouble-free operation.

**PLUS**

Attractive low profile
Extended Radio Shack layout
Silk-Smooth feel

**The Best Software**

Our Versakey Software enhances the keyboard's utility:

* Auto-repeat, n-key rollover and type-ahead
* F-1 becomes DEFINE, F-4 becomes CTRL
* May define up to 128 keys (including SHIFT, CTRL, and SHIFT-CTRL combinations) as strings of up to 80 characters each.
* Supplied on cassette, may be copied to disk.

**The Best Manual**

* Very complete documentation (including plenty of figures to illustrate the keyboard's installation and versatility).

**The Best Prices**

| | |
|---|---|
| The "Premium" Keyboard (including software) | $79.95 |
| The "Professional" Keyboard (including software) | $59.95 |
| The "Versakey Software" | $ 9.95 |

Please specify your computer's PC board type if known. Otherwise, specify the complete catalog number and serial number.

**Micronix Systems is a subdivision of Macrotron Systems Corporation.

**MACROTRON SYSTEMS CORP.**
**8147 Delmar Blvd.**
**St. Louis, MO 63130**
**(314) 721-3356**
**Telex 704523 Answer Back-MACANITA STL UD**

Terms: Prepaid check or money order, Mastercard or Visa.
Shipping Charges: U.S. $3.00, Canada $6.00, COD $5.00 (No COD's to Canada).

# *Random* BASIC — A Useful, Timely OS-9 Programming Language

If you are the pioneering type, like I am, you probably rushed right out to get Radio Shack's new OS-9 operating system for your CoCo. After the initial elation with this very powerful and flexible operating system has worn off, something suddenly becomes obvious. There isn't any software available to run under OS-9, and unless you are into assembly language programming, you can't even write your own programs. As usual, the CoCo software vendors are doing something about this. Each new issue of THE RAINBOW brings more and more ads for OS-9 software, as well as OS-9 programming languages.

*Random BASIC*, as you might have guessed, is a BASIC programming language that is designed to run under the control of OS-9. It is very similar to the Disk Extended BASIC that you should be used to, and it also has several features that are unique to the world of OS-9.

I will not describe or even list every feature of *Random BASIC:* To do so would make for a very long and boring review. Instead, I will concentrate on the features that are not found in Disk Extended BASIC.

*Random BASIC* has the following operating characteristics: Line numbers must be in the range of 1 through 9999; a program line can contain a maximum of 128 characters; multiple statements per line are supported; the range of numbers that can be used is 1.0E−99 to 9.9999999999E+99, with accuracy to 11 digits. Also, string variables can contain up to 128 characters; variable names can be up to 126 characters in length, with the first six characters being significant. There is also a difference between upper- and lowercase variable names (e.g., "VARA" and "vara" are two different variable names).

Some of the commands are unique to the OS-9 environment. SIZE lets you know how much memory your program uses, and how much memory is still available. This is important to know, because in OS-9 you can start up BASIC with different amounts of memory allocated to it. SHELL allows you to enter any OS-9 command without having to leave BASIC. FCHK will determine the presence or absence of a file on disk. If your Disk BASIC program has ever died because of an AE or NE Error, you will be sure to like this one. The DATE$ and TIME$ commands provide you with the information that you would expect. PROCNO returns the OS-9 procedure number of BASIC itself, which is usually three, unless you are using OS-9's multi-user capabilities. USRNO returns the OS-9 user number of the operator using the program. This can be used, for example, to make sure that only certain people are allowed to use the program (via the OS-9 LOGIN command).

A number of commands unique to *Random BASIC* are as follows. AUTO gives you the ability to have BASIC assign line numbers automatically for you while you are entering a program. DIGITS is used to specify the number of digits to be printed to the right of the decimal point. DUMP will display a list of all files and variables defined at the time the command is entered. PI returns the value of 3.14159265. ESC is used to send special control codes to your printer. It actually sends two characters — an escape character ($1B), followed by the control code you specify. ON ERROR allows you to trap any errors that might occur during program execution (not that you would ever have any). It also allows you to find out what the error was, and the line number where it occurred. Saving the best for last, SORT will put any single dimensioned array into ascending sequence in just one line of code!

*Random BASIC* also has extensive commands to handle both sequential and random access disk files, which are similar to those of Disk Extended BASIC. There were two commands I could think of that it does not have. The first of these is *RENUM*, which I thought was standard in all recent versions of BASIC. The second one is *LLIST*. At first I thought, "they must be kidding," so I dug further into the documentation. It took me a while to figure out how to get the *LIST* command to send its output to my printer, and I couldn't help wondering why such a basic operation was not explained in the documentation.

Using *Random BASIC* is very easy if you have ever programmed using Disk Extended BASIC. During the time I had the program for review, it performed flawlessly. The only real criticism I have is with the EDIT command, which is limited to simple changing of characters on a line. In other words, no insert, delete, search, etc. The version I have for review did not include any commands for handling graphics and sounds. However, it did include a form to fill out for a free upgrade to a version that will have these features, which will probably be available by the time you read this review. *[Editor's Note: This version is now available.]* The documentation provided, about 50 pages, is clear and concise, but did not have enough examples of how to use most of the unfamilar commands. *[Editor's Note: The newest version includes a number of demos on the disk, ready to be run and listed.]*

Despite these minor problems, *Random BASIC* is probably the way to go if you want to do any programming on your OS-9 system using BASIC.

**(Computerware, Box 668, 4403 Manchester Ave., Suite 102,
Encinitas, CA 92024, 64K Disk/OS-9 $75)**

**— Gerry Schechter**

---

*Hints . . .*

# 64K Memory Upgrade — NC Board And TDP System 100

Install a set of 4164 64K RAM chips. Clip out capacitors C58, C60, C62, C64, C66, C68, C70 and C72 located next to the RAM sockets. Move the three 16K/64K jumpers to the 64K position. Solder together the two bare pins next to U17.

*Ed Ellers*

# *Talking Score-EZ* Makes Good Game Great

Want to play a fun game? Not a whizz-bang arcade game, but a thinking game that can hold the interest of the entire family. Try *Talking Score-EZ.*

This is an electronic version of the Yahtzee dice game but with an interesting twist — it talks to you! In addition to using the color and sound of the Color Computer, it uses the Spectrum Projects Voice Pak to announce the score of each die as it is rolled, how many rolls are left, and whose turn it is. Up to six players can play, with the CoCo keeping track of who is up and a running score.

If you're not familiar with Yahtzee, it's a dice game where you try to get the best score of "hand" by rolling up to five dice three times. It's a game of skill and luck made more interesting through the computer.

Jarb Software has made the computer a "dealer," rolling the dice, giving you the score, and prompting you to the next step. The program even has its humorous moments. If you delay a move, the voice chides you with a series of sarcastic messages such as: "If you don't hurry, I'll BYTE you — get it, byte — hee-hee-hee" or "Hurry up, it's your electric bill." Cute, and it adds interest to the game. The kids were stalling to see (hear) what it would say next.

At the end of each move, the computer calculates your score and posts it in the scorecard shown on the screen. At the end of the game, final scores are announced and you have the option of replaying.

The addition of the voice capability makes this good game great! The game is well thought-out and easy to operate so that my kids, seven and 10, had no difficulty. Everyone in the family will enjoy playing it.

Alas, the heavy use of voice and graphics requires a 32K CoCo.

**(Jarb Software, 1636 D Avenue, Suite C, National City, CA 92050, 32K, $24.95, requires Spectrum Projects Voice Pak)**

**— Bruce Rothermel**

# Start Off Right With *Assembler Math*

Rainbow Connection Software has a nice tutorial program in *Assembler Math.* Covering the processes of decimal to binary, decimal to hexadecimal, binary to decimal, binary to hexadecimal, and simple arithmetic operations in these areas, it proved simple to use and easy to work with.

Using a drill and practice format, with randomly generated problems, *Assembler Math* had me doing binary arithmetic in 30 minutes. The 10-page, neatly executed instruction booklet covers the activities listed, and using it I was able to answer successfully the problems presented. In some cases it was necessary to use "rote" procedure, as I was a bit confused by binary subtraction. Using the techniques given in the program (the booklet acts as a supplement), it was possible to determine the correct answer in each case.

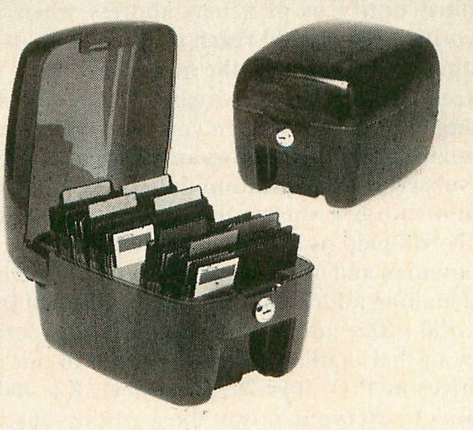
The on-screen presentation is clear and precise, with varied text formats and simple audio cues used to indicate if an answer is correct or not.

While I would have liked a somewhat expanded documentation, that given is sufficient to the job. After about two hours it was possible to work through any given problem, with only an occasional downbeat note to say I had mis-keyed (by this time most errors were caused by fat fingers).

If you are about to start assembly programming, or know someone who is, *Assembler Math* will get you off to a good start.

**(Rainbow Connection Software, 3514 6th Place N.W., Rochester, MN 55901, 32K Extended, $24.95 cassette, $27.95 disk)**

**— Nevin Templin**



LOCKING DISKETTE STORAGE SYSTEM

HOLDS 70 MINI-DISKETTES
A LOCKING STORAGE SYSTEM FOR 5 1/4" DISKETTES, INCLUDES A HINGED LID, TWO BUILT-IN CARRYING HANDLES. COMPLETE WITH INTERIOR DIVIDERS, TWO KEYS. INJECTION MOLDED OF HIGH IMPACT PLASTIC.
$24.95 + $2.00 S/H
MARYLAND RESIDENTS ADD 5% SALES TAX
DISK-HAVEN PRODUCTS
P.O. BOX 443
COCKEYSVILLE, MD 21030

RAINBOW CERTIFICATION SEAL

# *Shenanigans* Adventure Is A Pot Of Gold

*Shenanigans* is a graphic Adventure for a 32K disk or cassette Color Computer. It is a great program to show off the power and graphic capability of your computer while still having fun with it. It is a must for everyone's software library.

When you first load and *EXECute* the program, you get a very well done graphic title page. You then start your search for the magnificent pot of gold and enormous wealth hidden by leprechauns at the end of the rainbow. Starting in your bedroom, and searching for the leprechauns' gold, you have to explore the city streets and venture into the world under the subway.

*Shenanigans* is a breakthrough in graphics picture compression. When playing this Adventure, a graphics representation of what you see appears near the top third of the screen and the bottom two-thirds is the text explanation and location of where you are typing. What is so great about this Adventure is that almost all of the locations have their own graphics picture. Not only do all locations have pictures, but when you find an object in a location, it will graphically appear at the top. Most objects appear on the graphics picture.

The pictures are amazing. The combination of high resolution graphics pictures with fine details and the colors created by setting bit patterns creates many colors. The graphics pictures themselves are well worth the price of this Adventure. The skill in which the graphics — both pictures and objects — were incorporated into this program keep not only your eyes pleased, but will keep you entertained, interested and working hard at this Adventure until you solve it.

Since *Shenanigans* is always in the graphic mode 6R (BASIC *PMODE 4,1*), all the words must be printed on the graphics pages and Mark Data has done an excellent job designing the letters. The lowercase letters do have descenders.

When playing *Shenanigans* you will appreciate the abbreviations available. To travel north, south, east, west, up and down, just type the first letter of each word. You can also use the first letter on get, put, inventory, and look. Another thing you will find very useful and helpful for speed and typing purposes is the ability to get or put all of the visible objects.

One small inconvenience for disk users is that when you save or load your position in the game, it does it to cassette only. Another inconvenience is that there is no way to end a game and start a new one. If you press the Reset button, the title page will reappear and when you press any key you are right where you were previously. If for some reason you get thrown in jail or are in a place you can't get out of, you have to turn off the computer and reload the program. This is a real big inconvenience, especially if you're loading from tape. This is the only thing, I think, that can be improved in this Adventure.

Over all, *Shenanigans* is one of, if not the best Adventure ever written for a 32K Disk Color Computer and is absolutely the best Adventure ever written for a 32K cassette Color Computer. The Adventure is reasonably hard to solve, but is still fun for both beginner and advanced Adventurer alike.

**(Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, tape $24.95, disk $27.95)**

**— Jeffrey Loeliger**

**Talk is Cheap!**
**your Color Computer can talk for only**
**$29.95**

**SPEAK UP!™ is a machine language, voice synthesizer program for the TRS-80 Color Computer.* It is 100% software—nothing else to buy. Best of all, *YOU* can make BASIC programs talk!**

- 16K, 32K, 64K all on one cassette
- Text-to-speech makes it easy to use
- SPEAK UP! will say anything
- Reviewed in April '83 issue of *Rainbow*
- Reviewed in Oct. '83 *Color Computer*
- COD, VISA, MC, checks—no delay

**ORDER NOW 800-334-0854 EXT.890**

MasterCard RAINBOW CERTIFICATION SEAL VISA

Classical Computing, Inc.
P.O. Box 3318
Chapel Hill, NC 27515

*TM by Tandy Corp.

## About Your Subscription

**Your copy of THE RAINBOW is sent second class mail and, for subscribers in the United States, the date of mailing is printed on the label. If you do not receive your copy by the 25th of any month, send us a card and we will mail another immediately via first class mail.**

**You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.**

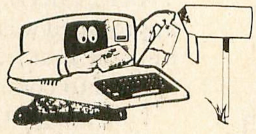
**Your mailing label also shows an "account number" and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.**

**For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at P.O. Box 209, Prospect, KY 40059. This applies to everyone *except* those whose subscriptions are through our distributor in Australia.**

# I HAVE SOMETHING TO SAY!

*For as little as 46 cents* a program you can enjoy great games like **FROGJUMP, FRENZY, CATERPILLAR CAVE, SHOOTIN GALLERY,** and great adventures. Use powerful home management programs such as **BUDGET, STOCK MARKET, BARTENDER, TINY CALC,** and **COST OF LIVING.** Also, enjoy the use of powerful programming utilities such as **COCO MONITOR, GRAPHIC SCREEN PRINT, RAM TEST, HIGH RESOLUTION TEXT,** and **SINGLE DISK COPY.** Increase your knowledge with educational programs such as **BASIC SPEED UP TUTORIAL, FLASH CARD, TRIGONOMETRY TUTOR,** and our **8 PART SERIES ON MACHINE LANGUAGE.**

⁂ Many programs use machine language! ⁂



Every month you will receive a cassette tape with 10 ready to run documented programs.

16K Extended Required

ORDERS SENT SAME DAY!
FIRST CLASS SHIPPING!
Back Issues Available from July, 1982.
Call or write for our free catalog.
Dealer Inquiries Invited.

MasterCard VISA

**PRICES**

| | |
|---|---|
| 1 YR (12 ISSUES) . | $55.00 |
| 6 MO (6 ISSUES) . | $30.00 |
| SINGLE COPIES . | $ 6.00 |

MICHIGAN RESIDENTS ADD 4% TO ORDER

OVERSEAS ADD $10.00 TO SUBSCRIPTION AND $1.00 TO SINGLE COPIES.

**PERSONAL CHECKS WELCOMED!**

## ★★★★ FREE PROGRAMS ★★★★

ON ANY ORDER OF 20 OR MORE TAPES OR 10 OR MORE DISKETTES YOU WILL RECEIVE TWO COLOR COMPUTER PROGRAMS OF THE ABOVE PRODUCT!

**COMPUTER CASSETTES**

- ★ 5 SCREW SHELL
- ★ FREE LABELS
- ★ ERROR FREE TAPE
- ★ IMMEDIATE SHIPPING

T&D

T&D Computer Products
P.O. Box 256-C
Holland, MI 49423
(616) 396-7577

**DYNAMAG DISKETTES**

- ★ ONLY $1.60 EACH
- ★ 5¼" SINGLE SIDE DOUBLE DENSITY
- ★ 100% ERROR FREE
- ★ MEET ALL INDUSTRY SPECIFICIATIONS

| ITEM | PRICE | QUANT. | TOTAL |
|---|---|---|---|
| C-10 | .59 | | |
| C-20 | .69 | | |
| C-60 | .85 | | |
| C-90 | .99 | | |
| Cases | .18 | | |
| Diskettes | 1.60 | | |
| | | | |

| | | |
|---|---|---|
| Outside USA | Subtotal | |
| Add $3.00 | Shipping | 3.00 |
| USA funds | Mich. Res. | 4% |
| only | TOTAL | |

Name ______________________
Address ______________________
City ______________ St. ______ Zip ______
Credit Card ______________ Exp. ______

# *Espionage Island Adventure* For the Advanced *and* Beginner

"What did you do on your vacation?" seems to be a favorite question these days. "Did you go to Disneyland, visit L.A. or go to Club Med?" Well, I saw an ad for an all expenses paid submarine trip to a deserted island. Since this trip was sponsored by a friendly government, I decided to apply for the job. The only requirement was that I had to find a roll of top secret microfilm and then signal the submarine to pick me up.

I wish that I could say that the trip was a snap, but it was more difficult than I thought it would be. Oh sure, I've got beaches, trees, oceans, lakes, you know the scene. Actually this report is being sent to you by short-wave radio since I have not yet found the microfilm. Fortunately, the people who dropped me off took into account that I may not be as experienced as some of their other operatives: they provided me with special assistance.

My dossier included a list of special words that would help me find what I was looking for. In addition, they described each location I was visiting. Since I had a limited amount of copying paper, they allowed me to abbreviate directions I traveled by just writing down one letter (i.e., N=north). My government also allowed me to contact them by using a special "HELP" command. Sometimes they were useful, other times not.

I soon realized that, although I was having a good time, this was not an easy place to travel in or find clues. By nightfall, being too tired to continue, I used my trusty CCR-81 (code name: tape recorder) to save everything that had happened to me that day. It saved a lot of aggravation, since I would not have to start from the beginning each day.

I am enjoying this vacation, but as I said before, I do not know when I will find the microfilm and be able to return to civilization. Before I turn in my official report, I want to say that I know some computer enthusiasts may think they can do a better job of being an Adventure seeker than I. Well, if you want to come along, operatives are actively being sought by the intelligence agency using the code name "Owls Nest" for a mission named, *Espionage Island Adventure.*

I enjoyed working on *Espionage Island Adventure.* The program has a machine language auto-load feature that provides an interesting graphics screen while waiting for the program to begin. Some sound/music would have been a nice feature but was not included.

The beginning instructions tell you that you must locate the microfilm, return to the location where you were dropped off, and then shoot a flare. It is important to have the flare gun at the end of the game or else you cannot notify the submarine to escape.

The screen is in the standard format for Adventures: location, what you can see, directions you can go and what actions you want to take. Standard Adventure words are used (LOOK, EXAMINE, BREAK, HELP, CLIMB, TAKE, DROP, INVENTORY, etc.). One feature that I appreciated was that all directions could be typed in by using only the first letter (N = NORTH, S = SOUTH). This also applied to commands as LOOK.

I did not get the standard responses to my commands and I enjoyed not continually reading the old, "You cannot (blank) something." When I wanted to take a rock (no particular reason), I was told, "Okay. It's your back." Also, multiple responses are given for command statements so that if I still wanted that rock, I would not necessarily get the same answer back. Rephrasing is also used so you do not always get back the same word you typed in. This made the game more enjoyable. I can give you one hint, as any good spy knows, always double check your clues.

An in-progress save feature is included in the program so you can pick up where you left off rather than having to start from scratch each time. The program can be backed up but will not have the auto-start feature.

*Espionage Island* is a mid-range Adventure — interesting enough for the addicted Adventure player and not too hard for a beginner.

**(Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363, cassette $17.95 postpaid, 32K Extended)**

**— Michael F. Garozzo**

CANADIANS!

*AVOID CUSTOMS DELAYS & CHARGES*

ORDER YOUR SOFTWARE IN CANADA

WE HANDLE THE FOLLOWING PRODUCTS, ALL ON TAPE EXCEPT FLEXI-FILER

| COMPUTERWARE | |
|---|---|
| ADDRESS FACTORY | 24.95 |
| BLOCKHEAD | 36.95 |
| COLOR CONNECTION | 39.95 |
| DOODLE BUG | 36.95 |
| EL DIABLERO | 26.95 |
| FLEXI-FILER (DISC) | 87.95 |
| HOME MONEY MANAGER | 26.95 |
| MEGAPEDE | 29.95 |
| MOON HOPPER | 33.95 |
| NERBLE FORCE | 33.95 |
| PAC ATTACK | 33.95 |
| RAIL RUNNER | 33.95 |
| SEMI-DRAW | 29.95 |
| SHARK TREASURE | 29.95 |
| SPACE AMBUSH | 29.95 |
| SYNTHER 7 | 29.95 |

| TOM MIX | |
|---|---|
| PROTECTORS | 33.95 |
| SPACE SHUTTLE | 39.95 |
| TAPE DUPE | 29.95 |
| TAPE TO DISK | 24.95 |
| THE FROG | 37.95 |
| THE KING | 34.95 |
| TRAPFALL | 37.95 |

| MARK DATA | |
|---|---|
| COSMIC CLONES | 33.95 |
| GLAXXONS | 33.95 |
| EL BANDITO | 33.95 |
| SUPER SCREEN | 37.95 |

| SPECTRAL ASSOC. | |
|---|---|
| ALPHA SEARCH | 17.95 |
| ANDROID ATTACK | 29.95 |
| INVADERS | 24.95 |
| CUBIX | 29.95 |
| DEFENSE | 29.95 |
| GALAX ATTACK | 29.95 |
| GHOST GOBBLER | 26.95 |
| KEYS OF THE WIZARD | 26.95 |
| LANCER | 29.95 |
| MAGIC BOX | 31.95 |
| MS. GOBBLER | 29.95 |
| PLANET INVASION | 29.95 |
| SPACE RACE | 29.95 |
| SPACE WAR | 29.95 |
| STORM ARROWS | 29.95 |
| TRILOGY | 67.95 |
| WHIRLYBIRD RUN | 29.95 |

| PRICKLY PEAR | |
|---|---|
| ANCIENT WISDOM TRILOGY | 53.95 |
| ASTROLOGY | 47.95 |
| 8-BIT BARTENDER | 26.95 |
| FLIGHT | 26.95 |
| GANGBUSTERS | 26.95 |
| TEEEOFF | 33.95 |
| HOUSEHOLD HELPER | 26.95 |
| JUNGLE | 26.95 |
| MONSTERS & MAGIC | 26.95 |
| SHAFT | 33.95 |
| SONGBOOK | 39.95 |
| VIKINGS | 26.95 |

ALL ITEMS INCLUDE SHIPPING AND HANDLING — ALL PRICES
IN CANADIAN DOLLARS
10% DISC. ON 2 ITEMS — 15% ON 3 OR MORE ITEMS
ONT. RESIDENTS ADD 7% TAX

*VISA — MASTERCARD ACCEPTED*

*FOR CATALOG SEND $2 (REFUNDED FIRST ORDER) TO:*

T & S SOFTWARE

P.O. BOX 583 ORLEANS, ONT. K1C 1S9
SOME ITEMS ALSO AVAILABLE AT COTS MICROSYSTEMS,
1396 STARTOP ROAD, OTTAWA

the MEMO MINDER

RAINBOW CERTIFICATION SEAL

REQUIRES 16K ECB

Get organized - that's why you bought your CoCo. Type in memos, phone numbers, dates, reference notes, anything. Enter a phrase, keyword, even a few letters and locate a record - fast. It's an easy to use program and just right for odds and ends that won't "fit" in a structured data base.

$9.95 M.O. or Check - No Delay
Cassette includes
Tape & Disk Version

MERRICK & CO
P.O. Box 73
Conifer, CO 80433

# The HJL-57 Keyboard

Radio Shack
TRS-80
COLOR COMPUTER

# Compare it with the rest. Then, buy the best.

If you've been thinking about spending good money on a new keyboard for your Color Computer, why not get a good keyboard for your money?

Designed from scratch, the HJL-57 Professional Keyboard is built to unlock ALL the potential performance of your Color Computer. Now, you can do real word processing and sail through lengthy listings...with maximum speed; minimum errors.

At $79.95, the HJL-57 is reasonably priced, but you can find other CoCo keyboards for a few dollars less. So, before you buy, we suggest that you compare.

**Compare Design.**

The ergonomically-superior HJL-57 has sculptured, low profile keycaps; and the three-color layout is identical to the original CoCo keyboard.

**Compare Construction.**

The HJL-57 has a rigidized aluminum baseplate for solid, no-flex mounting. Switch contacts are rated for 100 million cycles minimum, and covered by a spill-proof membrane.

**Compare Performance.**

Offering more than full-travel, bounce-proof keyswitches, the HJL-57 has RFI/EMI shielding that eliminates irritating noise on displays; and four user-definable function keys (one latchable), specially-positioned to avoid inadvertent actuation.

**Compare Installation.**

Carefully engineered for easy installation, the HJL-57 requires no soldering, drilling or gluing. Simply plug it in and drop it right on the original CoCo mounting posts. Kit includes a new bezel for a totally finished conversion.

**Free Function Key Program**

Your HJL-57 kit includes usage instructions and decimal codes produced by the function keys, plus a free sample program that defines the function keys as follows: F1 = Screen dump to printer. F2 = Repeat key (latching). F3 = Lower case upper case flip (if you have lower case capability). F4 = Control key; subtracts 64 from the ASCII value of any key pressed. Runs on disc or tape; extended or standard Basic.

**Compare Warranties.**

The HJL-57 is built so well, it carries a full, one-year warranty. And, it is sold with an exclusive 15-day money-back guarantee.

**Compare Value.**

You know that a bargain is a bargain only so long as it lasts. If you shop carefully, we think you will agree...The HJL-57 is the last keyboard your CoCo will ever need. And that's **real** value.

**Order Today.**

Only $79.95, the HJL-57 is available for immediate shipment for either the original Color Computer (sold prior to October, 1982) or the F-version and TDP-100 (introduced in October, 1982), and the new 64K CoCo. **Now also available for CoCo 2.**

**Order by Phone Anytime**

**716-235-8358**

**24 hours, 7 days a week**

---

Ordering Information: Specify model (Original, F-version, or CoCo 2). Payment by C.O.D., check, MasterCard or Visa . Credit card customers include complete card number and expiration date. Add $2.00 for shipping ($3.50 for Canada). New York state residents add 7% sales tax.
Dealer inquiries invited. For dealer information in Eastern U.S. and Canada, call collect: 617-586-7614, Advanced Computer Services (distributor), 74 Plain Street, Brockton, MA 02401.

HJL
PRODUCTS INC.
955 Buffalo Road • P.O. Box 24954
Rochester, New York 14624

# Bible Adventure — An Exciting Old Testament Tour

If you have never lifted your staff to part the Red Sea, here's your chance!

*Bible Adventure*, from Sugar Software lets you do that — and in high resolution color.

This tour through five exciting stories of the Old Testament can be an important tool in Hebrew school or Sunday school, and it should be a welcome addition to any Judaeo-Christian home.

*Bible Adventure* is what it says — an Adventure game using five stories from the Bible which use the CoCo's graphics and speed to lead you through the Scriptures.

The program stays close to the Scripture, draws no extra conclusions and should set well with folks from all persuasions.

The documentation consists of a neatly prepared booklet which has fundamental directions for the game and a paragraph explaining the parameters of the program. Sugar Software suggests the game for youngsters above the age of 10, and I agree.

Even then I would think the game should be supervised by an adult who should keep on the sidelines as much as possible.

On my first time around I had the Bible open on my lap, and found the clues in there. I would suggest it might be wise for Bible-type game writers to indicate what version of the Bible they used to prepare their scenario. A simple NIV or KJV would do. Many people who play Bible games will do so with the Scriptures very near at hand (if not on their lap) and knowing the version can be a great help.

Susan P. Davis, director of marketing at Sugar Software, says the program was developed because she felt there was a need. Along with Donald Dunlap, she developed the present program and looks forward to similar offerings should there be a sufficient demand.

I am sure there is a need for Bible-based Adventure games. Many parents object to the scenarios of some games on very fundamental spiritual grounds. Using the Bible opens a vast treasure of exciting stories which should be learned and are valuable to the intellectual growth of the person.

Because so much of the game is fun to see and experience for the first time, I will not describe it in detail. There are some graphic and programming touches which really enhance playing and make you want to go on.

You start out in the Garden of Eden and have the choices Adam and Eve had. Making the right (or wrong) choice takes you to the next screen. Besides Adam and Eve, the stories are Noah and the Ark, Abraham and Isaac, Moses at the Red Sea and David and Goliath.

The clue-instructions are very simple and, as I said, follow the text of the Bible. Susan Davis said she may include a copy of the clue-instructions with each program, but I think it is far better to let the player discover them himself. If there seems to be no alternative, I think there could be provision to send a postcard for the answers or to call Sugar Software by phone for a little help.

The disk program I reviewed worked perfectly except you had better make sure of a clear cold start. I was using some other programs with machine language routines and then loaded *Bible Adventure*. The garbage deposits and resident machine language caused the program to malfunction, so remember to start with the Radio Shack billboard or you may get IE Errors and, like me, think you have crashed your program. This program is copy-protected.

I think this is a superior game in anybody's ballpark. I think it will be welcome at Schul and at school.

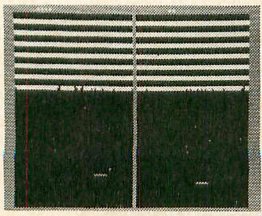
**(Sugar Software, 2153 Leah Lane, Reynoldsburg, OH, 43068, 16/32K ECB, tape $19.95, disk $24.95)**

**— Howard Lee Ball**

DOUBLE BUSTER

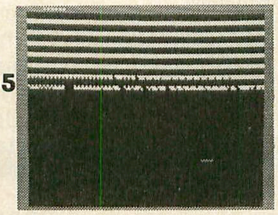
*(C) 1984 by Derringer Software, Inc.*

**No more fighting over who gets to play next! Double Buster lets two play this classic game at the same time. Players compete against each other and against the clock. Single player action is also available. Four levels of play allows beginners to have fun at slow speed and the more advanced players at high speed! Score is based on the amount of "bustin' out" you can accomplish within the allocated time. Scores kept for singles and doubles game in all levels.**



**DOUBLES**

**$21.95**



**SINGLES**

**Requires joysticks and can be played on 16K Extended tape or disk systems! Please indicate tape or disk when you order. Send check or money order to: Derringer Software, Inc. P. O. Box 5300, Florence, S.C. 29502-2300. Visa or Master Card customers can call (803) 665-5676 9:00am to 5:00pm Mon-Fri. Please include $2.00 for shipping and handling – No COD's.**

**★ See the ad for AT WITS END also ★**

INVENTORY CONTROL III

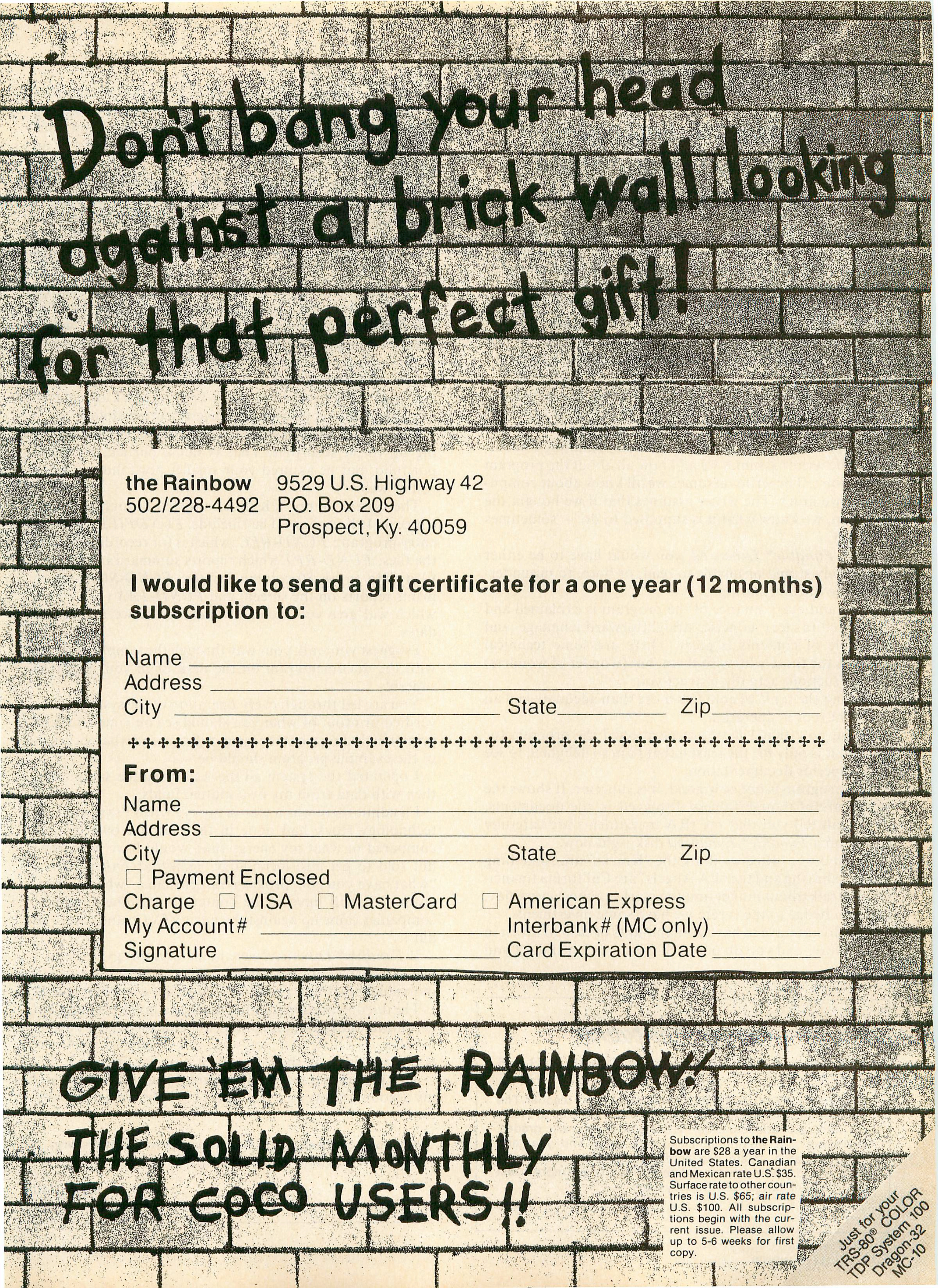
If you are looking for a quality inventory program look no more. Reviewed in Sept '82 issue, this program has all the necessary functions and more to handle most any job. Stores up to 1500 items. Min requirements: 32K, Ext. Basic and one drive. For more info write to addr below. **ONLY $79.95**

**** THIS ONE IS SUPERIOR TO VERSION II ****

Send check or money order to:

**TEAGUE ENGINEERING**
105 S. 12th, Dept A4, Murray, Ky. 42071

Dealer Inquires Invited


Don't bang your head against a brick wall looking for that perfect gift!
GIVE 'EM THE RAINBOW!
THE SOLID MONTHLY FOR COCO USERS!!

**the Rainbow** 9529 U.S. Highway 42
502/228-4492 P.O. Box 209
Prospect, Ky. 40059

**I would like to send a gift certificate for a one year (12 months) subscription to:**

Name ____________________
Address ____________________
City ______________ State ________ Zip ________

* * *

**From:**

Name ____________________
Address ____________________
City ______________ State ________ Zip ________
☐ Payment Enclosed
Charge ☐ VISA ☐ MasterCard ☐ American Express
My Account# ______________ Interbank# (MC only) ________
Signature ______________ Card Expiration Date ________

Subscriptions to **the Rainbow** are $28 a year in the United States. Canadian and Mexican rate U.S. $35. Surface rate to other countries is U.S. $65; air rate U.S. $100. All subscriptions begin with the current issue. Please allow up to 5-6 weeks for first copy.

Just for your
TRS-80® COLOR
TDP System 100
Dragon-32
MC-10

# *Fundfile* Enhanced* — An Easy-To-Understand Investment System

*Fundfile* Enhanced*, by Ray Parsons, is the most complete, best documented software package I have ever seen — and that includes the multi-thousand-dollar packages used on the big machines.

As a matter of fact, the documentation I received with my review copy of this new release of an old program is better than some I have received with a new hi-tech word processor at work, which costs about 10,000 times more than *Fundfile* Enhanced.*

On several occasions, I have seen programs which are great and operate perfectly, but you have to be a genius or able to read Sanskrit to follow the directions.

The problem with that kind of documentation is manifold. The writer assumes we all know all about the program — we don't. The writer assumes we all know about computers — we don't. The writer assumes that if we bought the program, we know what it is supposed to do — sometimes we don't.

With *Fundfile* Enhanced*, you would have to be either completely stupid or unable to read, or both, to misunderstand the documentation.

Each and every nuance of the program is explained and illustrated in clear, concise, straightforward language, and the table of contents is great. There are some technical answers for those who wish them, but (wonder of wonders) the instructions actually instruct you.

I found the table of contents more than adequate and an excellent tool in operation.

If you note that I have not mentioned the program (or system) it is only for the reason that I am so delighted to see such superior documentation.

The program is not only good, it is superior. It shows the same careful thoughtfulness displayed in the documents, and I can tell you that my IRA investments are carefully stored on a *Fundfile* Enhanced* disk right now.

Around our office we think the "Knicks" are something you get shaving and the "LA Angels" are California financiers. We talk about money and the market almost every day, and as a hedge to the future we have some investments.

You do not have to have vast amounts of cash to invest in your future, and you do not need great market skills if you invest in mutual funds.

*Fundfile* Enhanced* is designed to keep track of all of that for you and to give you some straight answers about the quality of your return, but most of all to let you know your financial position on screen or in print at the drop of an index.

I found only one small glitch in the system which Ray Parsons says he will correct in subsequent editions. Some of the so-called "no load funds" have imposed service fees for which *Fundfile* Enhanced* has no provision. With that small correction, I think the program-system is close to perfect.

You may make a backup copy of *Fundfile* Enhanced* which I think is a very good idea, because after you have run the demonstration you will make your own file which requires that some of the demo data be killed.

You may note I called *Fundfile* Enhanced* a "system" rather than a program. It is actually several programs all aimed at either gathering data, keeping track of data or displaying data concerning an investment portfolio.

On one disk you can store up to 900 transactions concerning up to 50 securities. That is not a particularly small portfolio, but be assured your smaller portfolio will work just as well.

The system on my 32K disk consisted of four programs (three on 16K version). They include: *FUNDFILE*, the main entry program; *FUND-REC*, which is for recording data in the files; *FUND-RPT* which reports summaries of various filed data to an 80-column printer; *FUND-SCR*, which prints reports on the screen; and *FUND-TAX* (32K only), which will give you income summaries between specified dates.

I suggest you walk your way through the sample program with the documentation on the desk or in your lap. It is superb!

You are led through every operation of the system with a verified printout of what you should see on your screen or printer including what the menu will say, and what the result of the example program should be.

I operated the system all the way using the sample and then with data from my own mutual funds.

I'll admit there was a tear in my eye when I saw what my technology stock had done in the period I owned it, as compared to what my energy fund would have had, had I not sold to get into technology. *Fundfile* Enhanced* is a "what have you got" program rather than a "what if," program so I will have to be content that some computer companies came up against the mighty CoCo and lost — so did I.

If *Fundfile* Enhanced* were in the Olympic gymnastics, I would give it a "10." From the smallest to the most extensive individual portfolio, *Fundfile* Enhanced* is a valuable tool.

The documentation may not come in a fancy package, but it is more understandable than some of the stuff I have in binders. As a matter of fact, some folks might do well to ask Ray Parsons to do their documentation for them.

This program is worth every penny you spend for it, and my accountant says the tax report could be a most valuable tool.

**(Parsons Software, 118 Woodshire Drive, Parkersburg, WV, 16K disk $27.95, 32K disk $37.95)**

**— Howard Lee Ball**

Aurora Computing

49 Brookland Ave., Aurora, Ontario Canada L4G 2H6

PRESENTS: **TEACHER'S PET** - A must for every teacher. The features include: 40 students per file, 4 terms with up to 9 tests per term, alphabetical order, letter grades, numeric grades, averaging and weighting, class lists, term and year end reports, search, delete, add, screen and printer output, enter classes and grades any time of year, disk I/O, and more in fast Machine Language. 32K Disk System.

............................................ $34.95

# *Pro-Color-File* Enhanced: A Good Database System

By Dan Downard

What do you say about a product that's already received a good review and the improvements have made it better? *Pro-Color-File* by Derringer Software should be considered by anyone interested in a database program for the CoCo. As I had never used *PCF*, the process I used was to evaluate the program as if it were new, read the previous review (June 1983 RAINBOW), and report the differences.

*PCF* is actually a collection of many menu-driven programs, written in BASIC, to form a neat filing system for the CoCo complete with math and relational sorting. A 32K CoCo with at least one disk drive is necessary. Up to four drives are supported. The 71-page manual is not only adequate but a tutorial on random files in general for the CoCo. Just to point out the versatility of the program the following tasks are used as examples.

- Mailing List
- Inventory
- Accounts Receivable
- Expense Accounts
- Club Membership Roster including Dues
- Checkbook Ledger

*PCF* has all of the requirements of a good database system. Both the field and disk space are dynamically allocated, up to 60 fields or 1,024 bytes per record. One of the examples, CLUBDUES, has 11 fields containing 105 bytes per record. On a normal data disk there would be room for about 1,000 records. This number could be multiplied by four if more drives were available. This is possible by a method Derringer uses called segmenting files. Actually, part of each record is stored on each drive.

One of the unusual features of *Pro-Color-File* is the ability to use colored backgrounds for your screen format. Even though I am not qualified in this area, I would say that the product excels in human engineering. How about user friendly? That's a more common term. While we are on the subject, this program does the best job of screen formatting I have seen on any CoCo program. Even though you are editing on a 32 x 16 screen, the moving window principle is used so that you are looking at exactly what you're going to see on the printer. Calibrated register marks on the top of the screen show the exact location of your text. There's even a center justification command.

One of the buzzwords used in the manual is "Setting up a database is as easy as A, B, C." Actually, it is not that easy. With this program a thorough understanding of the manual is necessary before you jump the gun. For those of you who learn by experimentation, the "ABCs" are actually three menu items.

A. Define Data Segments
B. Define Screen Formats
C. Define Equations

Item C is optional depending on your use of the math features. Math operations supported are addition, subtraction, multiplication, division and special totals. Fields called "scratch pad fields" are possible for storing intermediate math results. Totals and averages are supported not only for the standard report format, but another option called Summary Formats. Summary Formats are designed in much the same way as a standard report, but contain an analysis of several records. One of the true tests of a database, in addition to the math features, is its sorting capabilities. Indexed sorts using up to three key fields are possible. The size of sorts is limited by the number of records and the length of the sort field. Adequate information is given to prevent an OS or OM Error.

As you can tell I was pleased with *Pro-Color-File*. All was not roses, though. The program suffers unjustifiably from the lack of BASIC error trapping. I must admit that no data was lost, or even altered, but operator errors forced the program to crash several times during the learning phase. The other gripe I had was a little more serious. My main printer does not generate line feeds. It is a very small chore for a menu prompt asking whether line feeds are required and a small driver routine to accomodate us poor folks. My normal driver routine interfered with the proper operation of the program, so I had to switch printers for this program.

I would recommend *Pro-Color-File* for any type of database management necessary. I learned the program by making up a mailing list of the "world's greatest fifth/sixth grade soccer team." They were impressed. Then, I started putting a small inventory program for bulk material at work. I was impressed!

**(Derringer Software, Inc., P.O. Box 5300, Florence, SC 29502, disk $79.95)**

*"Plug in Kits" for* **CoCos*** *Including the new* **CoCo II** *from...* *MetroKit Retrofit*

1. **EYE-BALL SAVER.** Flip easily from NORMAL VIDEO when using games, to *REVERSE VIDEO* when you write text. Ready to plug in. Price $19.95....Order # MK 1233
2. **COCO SOUND.** Did you buy one of those video things to drive a monitor and now can't hear the sweet sounds of CoCo? No TV or external amp required. Price $24.95....Order #MK 1235, for COCO *II*s, order #MK 1235A
3. **COCO DRIVE.** Monochrome video driver. Make that text really readable. An improvement really worth plugging in. Price $19.95....Order #MK 1236
4. **DELUXE VERSIONS** for #1 and #3 combination. Price $29.95....#MK 1239

**METRO ELECTRONICS**, 5131 Mission St., San Francisco, CA 94112 (415) 333-1917 Established 1963
*Terms: Check, Money order, Visa/Master. Add $2.00 for Shipping and handling.*
** D & E Board will require soldering.* *[California residents add sales tax]*
→→→→→For COCO *II*s, add "A" to part number.←←←←←

# *Estimate* Provides Practice In Neglected Skill Area

The ability to approximate answers to arithmetic problems is an extremely useful skill, whether one is checking schoolwork, shopping for groceries, or reading the newspaper. Classroom instruction usually focuses on the methods for accurate solutions to problems and gives little practice in estimation. Computers are extremely well-suited for providing this type of drill, as they can generate an endless number of random problems at different ability levels, report how much the estimate differs from the actual answer, and display the time taken for solution.

*Estimate* is a drill program which provides such practice with arithmetic operations. One to five students may use the program together and each student may select his own skill level from the five offered. One to 50 problems may be selected for each round. Within each round all students practice the same arithmetic operation. Programs where more than one person can use the computer are always welcome, for even drill becomes a game for many students.

The program, as written, considers an answer within 10 percent of the actual value as correct. If the user wishes to modify this value, the instructions give the line number to change. If the student's response is more than 10 percent away from the correct value, he is shown the percentage by which his answer varies, and given a chance to try again. If his second try is still more than 10 percent off he is shown the correct answer, as well as the acceptable range of values. The time taken to respond to the problem is also shown. If the answer is within the acceptable limit, the screen flashes and random notes are played. Since the playing of these notes might be disturbing in a classroom, current versions of the program provide an option to eliminate the sounds. By pressing any key, the next student's name and problem appear. A good feature here is that the students' names appear randomly, rather than proceeding in a pre-established order. This tends to keep all actively involved, watching for the next name.

At the end of each round there is a scoreboard showing the number of problems which each participant answered correctly on the first try, the average percent error and the total time used. The term "average percent error" may cause confusion at first, because it includes the percent error from any first estimates which fall outside of the limits. Once the group understands this scoring method, it serves to provide more incentive to make a close estimate on the first try.

Although the instructions explain how to use the *Estimate* program itself, they could be improved by including some information on methods used for estimating answers. No suggestion is made as to the appropriate age group. In general, one waits until children have a solid grasp of arithmetic operations before demonstrating approximation methods, so that the upper elementary grades are the probable target group. I found that my test group of children, who attend several different schools in the area, needed to be shown some basic strategies before they were successful. While this demonstrates that estimating is an area where their schools provide insufficient training and practice, it points up the need to provide some instruction along with the program.

*Estimate* should prove a welcome addition to a library of drill programs, providing practice in a useful, too often neglected, skill. Since the idea of estimating is to quickly arrive at an approximate answer, without resorting to pencil and paper, computerized drill is especially useful.

**(Tom Mix Software, 4285 Bradford N.E., Grand Rapids, MI 49506, ECB tape $19.95, disk $22.95)**

**— Carol Kueppers**

**Meet the direct-connect Signalman MODEM**

Meet the direct-connect **SIGNALMAN MODEM** designed for use with RS-232C type Interface ... the smallest, lightest, most compact modem available today. Its long life 9-volt internal battery and exclusive audible Carrier Detect Signal allow you to install the SIGNALMAN anywhere ... out of the way, and out of sight. Now, there's no need for messy cables, and no need to look at a LED to verify carrier.

Anchor's SIGNALMAN is designed to operate only with modular telephones having plug-in handsets. Bell TRIMLINE™ type telephones which combine handset and dial are not suitable.

Your SIGNALMAN transmits both voice and data over all common telephone lines, and is fully compatible with Bell 103 modems – putting your computer in instant communications with thousands of other computers. And when you're in the data position, your SIGNALMAN automatically changes from ORIGINATE to ANSWER and back again as the need arises – ending all that confusion.

Anchor Automation has taken the fuss out of communications. For business or fun, SIGNALMAN is the ideal modem.

**$89.95** A.C. Adapter $8.95

*FREE...* with each modem **$100. VALUE** Subscription to The SOURCE + One Hour Hook-Up Time.

**COLORCOM/E**
SMART TERMINAL PACKAGE

- Complete Upload and Download Support
- Online Cassette/Disk Reads and Writes
- 110, 300, 600, or 1200 Baud
- Full or Half Duplex
- Preenter Data Before Calling (Saves $$'s)
- Offline and Online Scrolling
- ROM Pack or Disk
- Automatic Capture of Files
- Send All 127 ASCII Characters From Keyboard
- Word Mode Eliminates split Words
- 7 or 8 Data Bits (Including Graphics Support)
- Efficient Data Storage S-t-r-e-t-c-h-e-s Memory
- 100% Compatible w/Rainbow Connection BBS's
- Disk Version-64K and Hi Res screen now available!

COLORCOM/E $49.95

COLOR TERM +PLUS+
$29.95 (TAPE) Now even more • PLUS • features than before!!! *New and Improved!!* An Intelligent Terminal Program For The Color Computer or TDP 100.

**SOFTWARE PLUS**

6201 C Greenback Lane
Citrus Heights, CA 95610

Phone
(916) 726-8793

---

*Hints . . .*

# Rest Your Weary Head

Before shutting down your disk system, use this command to move the drive head to track 0:

```
DSKI$ 0,0,1,A$,B$
```

If you do this, the computer won't have to reposition the head to track 0 the next time you use the system. This stops the noise of the drive moving the head back and forth.

*Michael Carey*
*Tampa, FL*

The most
comprehensive
& flexible
data management
system available!

# FLEXI FILER

## Easy to Learn • Easy to Use

"Flexi Filer uses perhaps the easiest screen display format maker I have yet encountered."
Brian James,
Rainbow Magazine
November 1983

". . . this is an impressive and relatively inexpensive system that compares with some of the best."
Brian James,
Rainbow Magazine
November 1983

"Flexi Filer really shines in its ability to select subsets of a file."
Scott Norman,
Color Computer
Magazine
January 1984

"I was generally impressed with Flexi Filer."
Scott Norman,
Color Computer
Magazine
January 1984

"Flexi Filer is the easiest of the systems to learn."
Scott Norman,
Hot CoCo
February 1984

**COLLECT**
Up to *35 fields* per record, with up to *240 characters per record.* You designate the name of each field, its position, and its format, (alphanumeric, numeric, money, date, or exponential). The size of your *data base is unlimited* — only your disk space will limit your files.

**ORGANIZE**
You determine how the information is displayed and stored by *designing your own entry screens.* Your format can be changed any time. Easy screen definition makes data entry simple. The quick *assembly language keyboard* routine insures that you can't type faster than Flexi Filer!

**SELECT**
Using logical operators (less than, greater than, equal, and or) you can *select any subset* of your data base with up to *36 different criteria.* A *generic search* feature finds any occurrence of a given string in a field throughout the data base!

**SORT**
All or any selected subset of records can be sorted in ascending or descending order by any of your 35 fields with a very *FAST assembly language sort!*

**REPORT**
Design *customized reports* and labels to fit your individual needs, including page headings with titles, automatic page numbers, and column headers. Store up to 10 often-used formats. Numeric fields can be totaled automatically for summaries. Printing your information in the format most useful to you is a snap! And you can *set the baud rate* for faster printers too. Reports will print to the printer or screen.

NEW

**FILE MANAGER**
Sophisticated file manipulation is the sign of a true data base manager. With Flexi Filer you can *archive and/or delete records via selected subfiles.* (For example, archive records with an old date into a separate file and delete them from your working data disk. This frees up disk space without losing important data.)

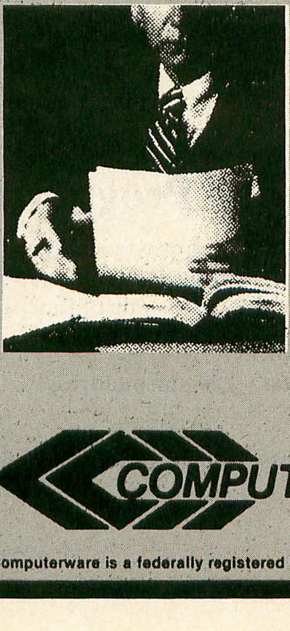
You can also *transfer data between files* — all records or selected subfiles. This is handy for adding fields to old database layouts or revising records without re-entering data!

Also included is *password* protection, *automatic expansion* of record files, and easy access to *user programs.*

**MANUAL**
Comprehensive documentation describes every feature and operation in easy to read terms, including system flow charts and report layout forms.

32K Disk **$69.95**

# VERSAMAIL



- Menu-driven program for mailing lists.
- Over 2500 records possible per file; over 800 possible on a single-disk system.
- Files may be on 1-4 drives; Versamail automatically selects the proper drive.
- 8 preset fields include Last Name, First Name, Company Name, Address, City, State, Zip Code, and Phone Number.
- 12 programmable fields allow you to tailor your mailing list to your needs.
- Names are automatically sorted on insertion — no special sort option needed.
- Logical selection allows you to search for records by any field with 6 different qualifiers.
- Binary search algorithm speeds record access.
- Many label formats, including custom "run time" message feature. Label formats may be saved or loaded from disk.
- Mail-merge feature allows you to create block letters with data from the mailing list. Can be used with any ASCII editor including Color Scribe, Telewriter, Scripsit, and Super Color Writer II.
- Printer baud rate, compression, and uncompression codes may be changed and saved to disk.
- Soundex Search allows you to look for a name without knowing how to spell it correctly — just type it sounds like. . .
- Requires 64K Color Computer, one disk drive, and an 80 or 132 column printer.
- Sorts by name and address automatically. Labels and listings may also be sorted by zip code with a fast assembly language sort.

64K disk **$39.95**

COMPUTERWARE ®

**ORDER NOW!** CALL: (619) 436-3512
OR WRITE: P.O. BOX 668 • ENCINITAS, CA 92024

Computerware is a federally registered trademark of Computerware.

# *Lunar Rover Patrol* Has Arcade Qualities

Explore the moon? Not me! But I can do the next best thing — play *Lunar Rover Patrol* from Spectral Associates. When I first got the program, it caught my eye because of its bright orange package and imaginative drawings decorating the cover.

I quickly opened the plastic package and pulled out the instructions that were included. The first unusual thing that I noticed was the paragraph telling me what to do if there was an error in loading. I had never seen this in a set of instructions and was pleased to see it in these. Reading down the page I saw a brief, but imaginative description of the game scenario. The instructions also told which controls do what and gave a score breakdown. Then, finally, on the last page there were some notes on why the program was copy protected, how to get a replacement if the original went bad, and other information.

Now I was ready to start playing. I got out my trusty (and dusty) old tape player and loaded the game. All I had to do was type *CLOADM* since the program is auto-loading. After a brief period of time, the computer drew the playing field and a short demo started. This was to show me what to do and also display the initials of the authors. After that, all I had to do was hit the fire button to start playing. By the way, at least one joystick is required, along with 32K of RAM.

The surface has been broken into segments labeled from "A" to "Z," which is used as a measure of progress. The number of rovers left is placed at the top right corner of the screen under a miniature rover, the progress is displayed on a gauge across the top, and the player's score is in the top left corner.

Speeding along the moon's surface was my realistic little rover. I was so busy watching the wheels bounce up and down along with the terrain and the clouds and mountains in the distance moving by that I ran into the first crater. After getting used to the game I was ready to go blasting away.

There were three types of obstacles I had to overcome. There were craters I had to jump over, boulders I could either jump over or shoot, and when I got better I met up with the dreaded saucers, which shot missiles at me. After the saucers appeared groups of elipses, and after them came triangles which, instead of trying to shoot me, blew new craters into the surface.

I thought I was doing really well until I got past letter "F." This was where the boulders started blocking my path in groups of two, which required pretty good timing to avoid crashing. The crash was well done, too. It consisted of an expanding and contracting mass of fire in the center along with two of the wheels bouncing off in opposite directions.

That wasn't the last of my surprises, though. After letter "O" there is a slight uphill climb, complete with rocks rolling down at me. Also, after many late-hour attempts to finish the course came the tanks, which are slightly smaller than the rover, shooting their way along in the opposite direction from which I was going.

Finally, I finished the "beginner course" only to find the distance meter reading "A" and the words "EXPERT COURSE" over my base, which only appears at the beginning of each course. Well, back to the drawing board.

If you enjoy the arcade game "Moon Patrol" as much as I do, then you will definitely like this excellent duplication of it, even if you do have to stay up late trying to "make it to point 'Z' just one more time."

**(Spectral Associates, 3418 South 90th Street, Tacoma, WA 98409, $21.95)**

**— James C. Sewell**

THE SOFT SHOP

*"For all your personal computer needs"*

| | |
|---|---|
| 64K Ram Chip Set | $ 55.95 |
| Super Pro Keyboard Kit | 65.95 |
| Botek Interface | 65.95 |
| Prowriter Printer (8510A) | 379.95 |
| Drive #0 | 359.95 |

-- ARCADE ACTION --

| | | TAPE | DISK |
|---|---|---|---|
| Zaxxon (Datasoft) | (32K) | 29.95 | 32.95 |
| CU*BER (Tom Mix) | (32K) | 26.95 | 29.95 |
| Junior's Revenge (Computerware) | (32K) | 26.95 | 29.95 |
| Calixto Island (Mark Data) | (32K) | 23.95 | 26.95 |

** For the serious Coco user **

| | | TAPE | DISK |
|---|---|---|---|
| OS-9 Operating Sys. | (64K) | -- | 65.95 |
| Basic09 (Req. OS-9) | (64K) | -- | 89.95 |
| Dynastar/Dynaform (Req. OS-9) | (64K) | -- | 95.99 |
| VIP Writer (Softlaw Corp.) | (32K) | ** | 55.95 |
| VIP Database (Softlaw Corp.) | (32K) | -- | 55.95 |
| VIP CALC (Softlaw Corp.) | (32K) | ** | 55.95 |

**Tape Version Included **

Call or write for a catalog

Be sure to call our BBS on-line from 10 p.m. to 7 a.m.!

**Terms:** Money Orders and Personal checks welcome (Please allow an additional 2 weeks for personal checks).

**Shipping:** $3.00 for Software, 3% for Hardware.

**C.O.D.:** Please add $3.00, Blue label add $3.00 - S.C. residents add 4% sales tax.

**Handling:** Handling Charges will be added to orders outside the continental U.S.

VISA and MASTERCARD ACCEPTED.

THE SOFT SHOP

P.O. Box 878 Mauldin, S.C. 29662

10 a.m. (803) 288-6983 8 p.m.

---

*Hints . . .*

## Offsetting ML Programs

To load a machine-language program from tape or disk at a different starting location, do a *CLOADM* (*LOADM* for disk) *"filename", offset* where *offset* is one of the following:

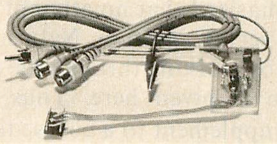
To move upwards in RAM —
*offset* = new start address - old start address

To move downwards —
*offset* = new start address - old start address + 65536

# MORETON BAY SOFTWARE

## DOUBLE DRIVER

The BEST monitor driver available, unlike some monitor drivers the Double Driver provides TRUE monochrome and color composite output. Audio Output. Solderless installation. $24.95

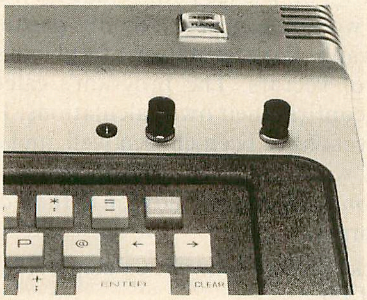


## RESET YOUR COMPUTER

A REAL Improvement

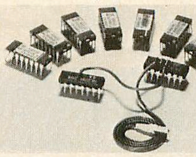
Move the power switch and reset where they belong. An LED power on light too! High quality parts. Totally solderless kit.

CoCo I $24.95
CoCo II $27.95



## 64K UPGRADES

Instantly access 64K via M/L Totally solderless kit to upgrade E Boards. Kit includes eight 4164 prime chips and chips U29 and U11 already soldered. E Board Kit $69.95
Color Computer II kit requires soldering. $64.95



## GRAPHICOM

The Ultimate Graphic Utility

You must see this program to believe it! Create pictures and text on the same screen. Now you can create pictures as good as any graphic you have seen on the color computer. Write graphic adventures or educational programs. Requires 64K EXB, Disk Drive and Joy Sticks $29.95

### MORETON BAY SOFTWARE

*A Division of Moreton Bay Laboratory*

316 CASTILLO STREET
SANTA BARBARA,
CALIFORNIA 93101
(805) 962-3127

see us at RAINBOWfest CHICAGO

## Ordering Information

Add $2.00 shipping and handling per order. We ship within 24 hours on receipt of order. Blue Label Service available. California residents add 6% sales tax.

## BUSINESS UTILITIES

**MORE BUSINESS** -Ver 3.12 The *preferred* business package. Completely interactive. General Ledger. Accounts Receivable. Accounts Payable. Customer Statements. Mailing Labels. Profit/Loss. Balance Sheet Statements. Our most powerful business package. Buy the best!

32K Disk R/S DOS $99.95

## UTILITIES FOR EVERYONE

**MORE INVENTORY** - Maintain an inventory of more than 1000 items. Know when to order, what has been ordered, quantity and value of any item. Calculate inventory value with single keystroke.

32K Disk R/S DOS $44.95

**COCOWRITER II** — Powerful and full featured. An excellent word processor at an affordable price. 32, 51, 64 or 85 characters per line, justify right, left, center, insert, delete, move blocks. Menu driven printing and formatting. Tabs, etc. One of the best values in word processing today!

16 K EXB Cassette $34.95, 16K EXB Disk $44.95

**FILE CABINET** — Data base, alphabetizes, sorts numeric entries, searches for key words or numbers, computes totals & averages by categories, saves records, changes or deletes them. Up to 20 entries for each record, up to 256 characters for each entry. Mailing list included. Output to screen printer or tape. Print all or selected records, +, −, ×, ÷ Numeric entries.

16K EXB Cassette $29.95

## THINKING GAMES

**TRIVIA — THE EINSTEIN EDITION** - A one to four player trivia game. More than 1900 challenging questions. Great for parties or family fun.

16K Non Extended $19.95 Cassette, $21.95 Disk

**ADVENTURE IN TOWER CASTLE** - Accept the challenge of Tower Castle! A classical word adventure with a graphic introduction and added features. Not just words on a green screen. Color and music stimulate your imagination.

32K EXB $17.95

## SCIENCE

**PLANETARIUM** — See the Heavens from the Earth. See the Earth from the Heavens. You command a computerized Planetarium. Five celestial programs on one cassette. A star chart to delight you. Accent 33 constellations and/or 21 first magnitude stars. Read the phases of the moon at a glance. View the stars in the Northern and Southern Hemispheres. Select any day or night from A.D. 101 to thousands of years in the future. See the location of the Sun, Moon, Mars, Venus, Jupiter and Saturn as they appear in your sky. A planet chart which locates the positions of the nine major planets. See the locations of the planets for any date A.D. 0 to thousands of years in the future. Watch the planets revolve around the Sun by days, months or years. Find the Zodiac sign of your birth and the location of every planet at that time. Includes charts of the Zodiac constellations.

16K Extended Basic Required, $19.95 cassette

# *Vector Addition* — Joining Forces With Education

Radio Shack has introduced another Color Computer program in its series called "Secondary Level Math & Science Programs." This one, called *Vector Addition*, teaches about vectors. Like the other programs in this series, it comes as a package, with software to perform calculations, and a book of worksheets which guides a student to learn by using the software.

A vector is a mathematical object which has both magnitude and direction. Many physical quantities have magnitude and direction, so vectors are very important in science and engineering. For example, a body in motion has speed and direction, and the electrical field at a point has intensity and direction. The usual way of representing a vector pictorially is as a directed line segment whose length is the magnitude of the vector and whose direction is the vectoral direction.

Vector addition is one of the most common vector operations. If two vectors represent forces acting on a body, the sum of the two vectors represents the combined force.

*Vector Addition* accepts as input a number of planes, or two-dimensional vectors, displays them as directed line segments on a high-resolution screen, and calculates their sum. The vectors can be displayed either from a common origin (where all the vectors emanate from a single point), or by tip-to-tail (where the ending point of one vector is the starting point of the next one). One minor problem is that in both of the high-resolution displays, no indication is given if two vectors overlap.

The worksheets present rather routine problems applying vector addition. They cover many different topics: displacement; velocity; acceleration; forces; gravitation; momentum; and electrical forces and fields. Some of the more difficult problems have hints, and all the problems have answers given in a separate section.

It must be emphasized that no attempt is made to teach about vectors or vector addition. Naturally, students will learn a great deal by working through the problems, but no actual instruction is given here. Thus, the package is appropriate as a supplement to a course teaching vectors.

The program comes with a clearly written user's guide that introduces the Color Computer and describes how to run the program. Step-by-step instructions are given for several sample problems, covering all aspects of the program's use. The program is provided on both tape and disk, requires 32K Extended BASIC, and is compatible with the Radio Shack Network 2 System.

Will high schools find *Vector Addition* useful? Certainly. Any mathematics or science course that teaches basic facts about vectors would be enriched by this package. Students will find the graphical presentation useful in understanding the concepts of vectors. The program's calculations will allow them to confirm their own calculations. The problems in the worksheets have been chosen well, and can easily be supplemented with problems appropriate to any course. *Vector Addition* is a welcome addition to the Color Computer software library.

**(Radio Shack Stores nationwide, Catalog No. 26-2638, tape and disk $39.95)**

**— David Finkel**

See us at RAINBOWfest CHICAGO
The Driving Force!
J&M SYSTEMS, LTD.

JFD - COCO DISC SYSTEM - $449

J & M Systems, Ltd. is a leader in the Model III marketplace with our JFD-III Disc Controller. With thousands in operation, we have set new standards in controller performance and reliability. We bring these same high standards to the COCO, resulting in the highest quality disc controller system on the market. Compare these functions before you buy:

- Price. $449 includes controller, first drive, disc basic in ROM, and manuals. Just plug it in.
- Never needs adjusting. Our exclusive Digital Phase Lock Loop Data Separator and Digital Precomp Circuit eliminates the 3 adjustments found on other controllers.
- High quality standard production disc drives. For improved service and reliability. Tandon & Teac drives provide twice the read sensitivity that the drives found in other disc systems do, and hold their alignment far longer.
- Gold-plated card edge connectors throughout.
- Software compatible with Radio Shack Disc Basic, Flex, and OS/9.

J & M Systems, Ltd., 137 Utah NE, Albuquerque, N.M. 87108
(505) 265-1501

# Safe To Go Back In The Water With *Slay The Nereis*

Continuing their support for the Color Computer, Radio Shack has released a new ROM Pak called *Slay The Nereis*. The theme of this new game is similar to that of the caterpillar-type games except this time the scenerio takes place under water and you are the commander of a small fleet of mini-subs.

To begin play, while the computer is off, insert the ROM Pak and then power-up. You have a choice of three background colors for the ocean. For a buff background, hold down the CLEAR key while turning on the computer, or hold down the SHIFT key for a green background. Black is the default.

As the game begins you will find yourself at the bottom of the ocean looking at the pattern of the waves above. Bubbles are seen all over and must be shot to give you room to maneuver. It takes four shots to eliminate each bubble. You are allowed to move about seven levels up or down to avoid the fish. The sound effects are excellent and vary throughout game play. Frequently there are two or three different sounds at once.

When the first wave of fish arrive, the graphics are very fluid — better than most of the other ROM Paks you are likely to come across. It is even, uniform, with no break-up, and is very colorful.

The fish begin their descent, and as you hit the school it will break up into two smaller ones. When hit, the fish float smoothly back up to the surface and will come back down again. The second time you score, a hit eliminates him.

Occasionally, a depth charge will form and sink straight down, leaving a new trail of bubbles which impede your firing path. You must either destroy the depth charge or get out of its way. Starfish, jellyfish and manta rays also move across the ocean floor. The point value awarded here depends on how close the creature is when you kill it.

Each round completed successfully raises the level of difficulty by one to a maximum of level 15. At this level it is quite challenging to maneuver since the game play is so fast.

*Slay The Nereis* also provides a pause feature, activated by pressing BREAK and resumed by holding SHIFT and then pressing CLEAR. At the beginning of the game, you are also asked what level you wish to start at; one, which is the lowest, or 15, which is the highest.

Documentation provided with the game cartridge is adequate and you could probably play the whole game immediately upon getting it home without even turning to Page 1. I found *Slay The Nereis* to be a challenging game which can be enjoyed by the whole family. The sounds and graphics are both very well done.

An added feature not mentioned in the documentation is that you won't need nose plugs before entering the water and lifesavers are not required when entering the *deep* end!

**(Radio Shack Stores nationwide, Cat. No. 26-3086, $24.95 ROM Pak)**

**— Steve Schechter**

The KEY-264K is here!!

DO YOU HAVE A 32K SYSTEM WITH 64K MEMORY CHIPS ?? ARE YOU STILL BEING TOLD YOU CAN ONLY USE 32K FROM BASIC ??

DON'T BELIEVE IT !! - KEY COLOR SOFTWARE brings you the KEY-264K. An exciting NEW SOFTWARE utility that allows any STANDARD 32K COLOR COMPUTER TO ACCESS 64K RAM FROM BASIC, and with NO HARDWARE MODIFICATIONS REQUIRED!!!

*** Works with CASSETTE based systems! *** *** Works with DISK based systems! ***

The KEY-264K divides the 64K ram memory into two 32K banks or sides, each of which can be utilized independently by the BASIC interpreter, with the ability to switch instantly from one side to the other. IT'S LIKE HAVING TWO COMPUTERS IN ONE!! Have your BASIC program on one side and keep your variables on the other side, or have your main program on one side and your subroutines on the other side, or have your program on one side and use the other side for 4 additional HI-RES pages, or any combination you like. The possibilities are endless because the KEY-264K allows full communication between sides plus the ability to switch back and forth at will, all from within BASIC. You could also have different programs in each side and switch back and forth between them using simple keystrokes, even while the programs are running!! Or run them both at the same time in the FOREGROUND/BACKGROUND MULTI-TASKING mode. Don't buy that printer buffer yet! With the KEY-264K you can be printing in the background side while utilizing your computer normally in the foreground side AT THE SAME TIME!!! Debugging a program? Use either a BASIC command or simple keystrokes to instantly duplicate your program, in it's present status, on the opposite side. Switch to the opposite side later and pick up exactly where you were before!

For DISK users, the KEY-264K allows you to alternate between DISK and EXTENDED BASIC on the same side with simple keystrokes. No need to pull your controller or power down. You can be in EXTENDED BASIC on one side and in DISK BASIC on the other side and still switch back and forth and have full communications between the two sides.

The KEY-264K does this and MORE thru extensions to BASIC. No need to learn a new language! The KEY-264K adds 15 NEW COMMANDS and 1 function to BASIC, including powerful new BLOCK MEMORY MOVE and GRAPHICS VIEWING commands.

The KEY-264K works on 32K systems with "E", "F", or even modified "D" boards and requires EXTENDED or DISK BASIC with GOOD 64K MEMORY CHIPS! Systems with piggy-back 32K or half-good 64K memory chips WILL NOT WORK!!

ORDER YOUR KEY-264K CASSETTE TODAY by sending check or money order for $39.95 plus $2.00 postage U.S.A. ($5.00 outside U.S.A.) Mass. residents add 5% sales tax.

KEY COLOR SOFTWARE
P.O. BOX 360
HARVARD, MA. 01451

MASTERCARD, VISA, OR COD
CALL (617) 263-1737

RAINBOW CERTIFICATION SEAL

WORKS WITH THE NEW 64K COLOR COMPUTER TOO!!

# No Demands Or Dancing Bears Just Good Educational Fun

*Kids' Choice* and *Early Letter Recognition* are a pair of early educational programs aimed at preschoolers between the ages of two and six. These two programs use a combination of simple text graphics, Hi-Res graphics, and simple animation techniques to help kids learn the alphabet, the numbers zero through nine, introduce them to the keyboard layout, and provide a fun time with mom and dad's computer.

*Early Letter Recognition* is just what the name implies. When any of the alphabetical keys is pressed, the computer responds with a graphics display. Each letter has its own unique display. Some displays are simple text graphics, some are drawings done in Hi-Res graphics, and some include animation. This mixture of graphics techniques is more interesting to watch than many sophisticated graphics programs and keeps boredom from setting in. Letters can be pressed any number of times and in any sequence. There are no sound effects used in any of the routines except for the letter 'Z'. When 'Z' is pressed, the tune of the alphabet song is played as the alphabet is printed on the screen.

*Kids' Choice* is a program for learning number recognition. In this program the numbers zero through nine are used. As in *Early Letter Recognition*, when any of the number keys are pressed, the computer responds with a graphics display. However, in *Kids' Choice* each number key has three possible displays that are chosen at random. For example, when the '2' key is pressed, you might see a drawing of the number two, or you might see two winking faces, or you might see two American flags. These number displays are without sound with the exception of one of the number '8' key displays. This one display simulates a piano with the 'A', 'S', 'D', 'F', 'G', 'H', 'J' and 'K' keys being used to play musical notes. Kids get a charge when they first realize that different displays are possible for each key. The zero key acts as a kind of "wild card," running a display of each number before doing zero itself.

I tested these programs on some kids ranging from age two to age six. The kids' first sessions with these programs typically lasted 20 to 30 minutes before they got distracted regardless of age. Earlier ages (two years old) enjoyed the displays, but without adult interaction did not make the connection between the key being pressed and the graphics displayed. Some of the displays are too long for younger attention spans. To get around this, you can BREAK the program and then re-enter by typing *RUN 100* (for *Early Letter Recognition*) or *RUN 50* (for *Kids' Choice*). Older ages (six years old) enjoyed the displays too, busily exploring the variety and choosing their favorite ones. Though older kids will probably already be familiar with the numbers and letters, these programs not only reinforce recognition, but teach the layout of the keyboard.

Written in Extended BASIC, these programs are easy to add to or modify for your own personal use. Adults and older kids learning to write their own programs will find interest in the variety of graphic techniques used.

You'll find no dancing bears or aliens in *Kids' Choice* and *Early Letter Recognition.* There are no quizzes, drills, or difficulty levels, either. These programs simply provide a fun and undemanding time learning with the computer. Of course, the best way for young children to experience any educational program is with an adult beside them. Parent and child can then make up their own drills or games. As fun and educational as computers can be, sharing the fun with Mom or Dad is even better.

**(Software Specialists, P.O. Box 2029, Princeton, NJ 08540, 16K Extended, $12.95 apiece or $19.95 for both)**

**— James Ventling**

Co Co - Cooler

RAINBOW

- ***Brings operating temperature to ambient, regardless of accessory load***
- ***Reduces temperature of ENTIRE computer . . . not just the SAM chip***
- ***Easy 1-minute installation***
- ***$39.95***

***Companion Keyboard Cover $7.95***
***Co Co Software***

- *For Fastest Service Send Money Order Or Certified Check*
- *Add $2.00 Shipping For Continental U.S.*
- *Add $4.00 Shipping For Alaska, Hawaii & Canada*
- *Add $15.00 Shipping For Overseas*
- *Add $3.00 For 220-250 Volt Model*
- *Calif. Residents Add 6½% Sales Tax*
- *Will Ship C.O.D. On U.S.A. Shipments Only*
- *All Merchandise Shipped From Stock*

***REM Industries, Inc.***
***9420 "B" Lurline Ave., Chatsworth, CA 91311***
***(213) 341-3719***

SPEED UP YOUR PROGRAMS NOW!

-Now everyone can create fast, efficient Machine Language programs without learning Assembly language programming. That's right, with this new BASIC COMPILER, called INTBASIC, one can convert BASIC programs to Machine Language.

-INTBASIC is a machine language program featuring most BASIC command words. It is compatible with Color, Extended Color and Disk BASIC systems. It loads from tape or disk and is EXECuted "In Memory" (NO DISK NEEDED).

-INTBASIC allows m.l. programs to use ALL 64K OF RAM. Versions for 16,32 and 64K systems are ALL INCLUDED FOR THE SAME PRICE. Color Computer II versions are also now available (Please indicate model #).

Tape- $39.95

Send check or
money order.
No C.O.D.
Utah residents
add 5% tax.

WASATCHWARE
7350 Nutree Drive
Salt Lake City, Utah
84121
Call (801) 943-6263

RAINBOW CERTIFICATION SEAL

-Send for our current list of other software available.

basic technology
real time clock calendar
RAM
BREAK
ENTER
CLEAR
SHIFT

# NEW for your COLOR COMPUTER

## Switchable Expansion Is Here

### CoCo HAS A COMPANION!!

**GOOD NEWS** Switch over to more versatility with the new **BT-2000 COMPANION.** Save CoCo's connector with the best **COMPANION** it will ever have.

- **Load** 5 cartridges into the **COMPANION** and avoid the hassles while enjoying the benefits of **push-button** selection.
- **Push a Button** or select from your keyboard to turn on one of your 5 selections. Handy indicator lights let you know at a glance which cartridge is connected.
- **No More Turn-Offs.** Just switch to the next cartridge in your **COMPANION.** Push a button to **Restart** without turning off the power.
- **Plug-in.** Fill one to five slots for flexible programming, game playing or both. Choose ROM Packs, serial ports, parallel ports, or disk drives. Then do what **you** like to do best. The most powerful and cost effective expansion you will find for just **$225.00**

### FOR THE ADVANCED USER OR EXPERIMENTER

- The utmost in expansion power and versatility is the **BT-1000 Expansion Interface Unit. $250.00**
- **Large Built-in power supply** to power your peripherals and experimenter circuits.
- Space for **your ML** utilities with optional 8K of RAM. **$275.00**

RAINBOW
CERTIFICATION
SEAL

**basic TECHNOLOGY** Dept. Q P.O. Box 511 Ortonville, MI 48462
(313) 627-6146

### ALSO NEW FROM BASIC TECHNOLOGY!!

- **BT-1010 PPI Parallel Printer Interface.** Free-up CoCo's serial port. Run your printer at top speed. Five foot cable with Centronics compatible connector and machine language printer driver are included. $79.95.
- **BT-1020 Real Time Clock/Calendar.** Let CoCo keep the time and date for your programs and files. Day-light savings time and leap year keep you on time. Save data or program memory even when power is off with 50 bytes of battery backed memory. Alarm capability to turn on the coffee pot. All for only $109.00. RAINBOW
- **BT-1030 VIP Versatile Interface Port.** Connect CoCo to the outside world with two 8-bit parallel ports, two 16-bit timer/counters and a serial shift register. All user programmable. $69.95.
- WRITE FOR FREE BROCHURE.

For years of trouble-free enjoyment all Basic Technology products use top quality components and are backed by a full 180 day parts and labor warranty. We service what we sell!!!

Add $5 shipping & handling for BT-1000, $2.50 for BT-1020. Michigan residents add 4% sales tax. Shipping & handling for residents of Canada, Hawaii, Alaska is $10. Overseas orders add 15%. Check, money order, VISA, MC (give account no., expiration date, phone no.). Personal checks allow 2-3 weeks to clear. COD charge $2 (requires certified check or money order).

*"Watch for more peripherals from Basic Technology."*

# *Business Manager:* Accounting For A Very Small Business

**By James F. Taylor**

*Business Manager* is a 32K Extended Color BASIC single-entry accounting program. The program code consumes about 10.5K of RAM and is capable of handling 300 transactions in memory at one time. Files may be saved to either cassette or disk. There are no specific sort or search options. Screen formatting and screen displays are very basic — nothing fancy. The program is unprotected and is easily changed to meet your specific needs.

The documentation for *Business Manager* consists of four pages of copy machine-reduced matrix print. It is entirely readable, however, and fairly well formatted. The content is comprised of a short paragraph on getting started, which describes the process of defining accounts; a short paragraph on each of the 11 main menu selections; and four "Hints and Tips." While the information does describe each option, it does not detail how they can be used effectively for accounting for the day-to-day transactions of a small business. All in all, it is sufficient to get you started.

The main menu of *Business Manager* consists of a numbered listing on the screen. Your selection is made by keying and entering the number of the selection. If you should happen to enter an alpha character, your CoCo will prompt you with *REDO*, and the menu will begin to scroll off the top of the screen. All portions of the program are either menu-driven or are fully prompted.

The operating speed of the program was generally excellent. The only occasions where it was necessary to wait a substantial amount of time for the program to complete a function were when deleting an entry with hundreds of transactions in memory, and when "Condensing Transactions." The condensing function allows you to delete up to a specified transaction number in memory while retaining the amounts of the transactions in the account totals. With a maximum of only 300 transactions in memory at one time, I found this function superfluous.

As with other programs of this type, the first step is to define your income or expense accounts (28 maximum). Defining the accounts is a breeze. You are prompted with an account number and are asked to input an account name. You are then asked whether the account is an income or expense account. A small problem surfaces here which conflicts with the author's claim that the system is "user proof."

Although the documentation does mention an eight character limit to the length of the account names, there is no screen prompt to that effect. Also, the program will accept anything at all, and makes no effort to fix entries that are too long. *(Editor's Note: In the latest versions of this program, no more than eight characters will be accepted.)* The only way to fix an account name once entered is to delete the account and redefine it. This is no problem if you haven't entered any transactions into the account. If you have, they will be lost. Once the accounts are defined, you can alphabetize them for easier reference in other portions of the program and list them to the printer or screen.

Entering transactions is a simple task with this program. After entering a '1' at the main menu, a numbered listing of

ARIZONA DISCOUNT SOFTWARE
123 NORTH SIRRINE #220H • MESA, ARIZONA 85201

NOTE THE SAVINGS!!

25% OFF RETAIL
GAMES BY:
COMPUTERWARE
COLORQUEST
SPECTRAL

PRICES EFFECTIVE THROUGH JUNE 15 1984

20% OFF RETAIL
GAMES BY:
TOM MIX
PRICKLY PEAR
MISHTRON

20% OFF RETAIL
ALL BUSINESS PROGRAMS
VIP LIBRARY $210.00
VIP BUS. LIBRARY $139.95
ELITE LIBRARY $150.00

PRICE AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE

20% OFF RETAIL
ALL UTILITIES

MasterCard VISA

TO ORDER We accept Master Charge and Visa, Money Orders and personal checks welcome. No delay. Continental U.S. orders please include $2.00 postage and handling except VIP orders which are $2.00 per piece. All international orders please add 10% shipping and handling fee. Arizona residents add 6% sales tax.

24 Hour Order Line: 800-221-9280 Ext. 988 (Orders Only)
Inquiries, Arizona Orders (602) 827-0923
Phone answered personally 1:00 p.m. to 5:00 p.m. MST

your accounts is displayed. Press the number of the account into which you wish to enter a transaction and press ENTER. You are then prompted with "Payable to/from," which allows you to enter the source of income or to whom a bill is paid, followed by prompts for the date and the amount of the transaction. The date is input in the form "1/12" for Jan. 12 since the program is oriented toward monthly reports. There is no limit to the number of digits of the dollar amount stated in the documentation or program. It does handle tens of thousands though, which is sufficient for a monthly transaction (at least for me). If you make an error in entering a transaction, you may either delete it then re-enter it, or just replace it.

Both processes require you to identify the transaction number. Although there is no search function available in the program, it is usually easy to find a particular transaction by listing the transactions of the particular account to which it was posted.

There are six report formats. All except one can be directed optionally to the screen or printer. You can list all transactions in a particular account, list all transactions, list account totals, print all transactions (to the printer), and generate a monthly or yearly statement. All of these options work relatively well. The only real "bugs" I found were that the program crashed with an OM Error (Out Of Memory) when generating any reports that accumulated totals for one or more accounts, and that the screen version of the yearly report displayed a "Press ENTER to continue" prompt where none was necessary. I traced the OM Error to a *CLEAR 1000* statement in the early lines of the program. This apparently didn't leave room for the number of numeric variables needed to generate cumulative reports. I changed this to *CLEAR 5000* and the problem disappeared. Also, I was still able to load the limit 300 transactions into the program and use all the available functions. Even though the program did crash, I didn't lose any data. By following the "Hints and Tips" from the documentation and entering *GOTO 20* to re-enter the program, all data was retained in memory. Whew! *(Editor's Note: We are told that the bug which produced the OM Error has now been fixed.)*

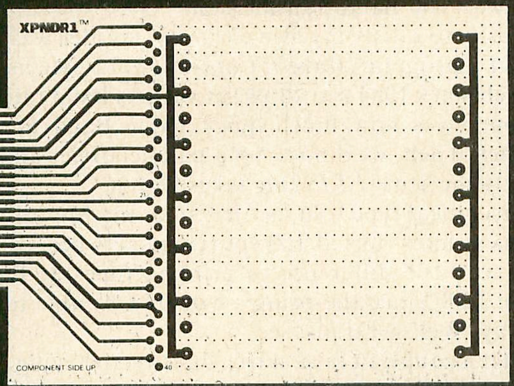
The monthly and yearly reports are actually profit and loss statements, and not balance sheets as stated with the program. The format is not the typical accounting report. There are column headings (the date which you input and "AMOUNT"), but they are not separated from the data. The income and expense categories are listed separately. In general, the reports are unattractive, and resemble (in a small way) the data dumps from those old neanderthal data processing systems. They are appropriate for information purposes, but are not a very good record for management or tax purposes.

One problem with the reports processing of this program is that the user has no control of the filenames used by the program. Therefore, when you start a new month and move your accumulators to the yearly statement, you lose the transaction data for the previous month (IRS would never believe you). On a tape system, one could just retain the tape for the previous month, but on a disk system it could be a real hassle. You would either have to use a new disk for each month (each with probably 60 granules still available), or you could copy the program data files to new filenames on the disk before using the "Begin New Month" option. If you did the latter and wanted to review a prior month, you would have to rename the current month files (three of them), then rename the file you wished to review, etc. The ability to retain and review previous months' transaction data for those with a disk system would surely simplify matters.

I hope I haven't sounded too negative about *Business Manager*. It does have one major strong point. It works! All functions of the program perform as stated in the documentation. I do recommend it to those of you with cassette systems. I don't feel it is particularly suited to a disk system, although you could get by with it. The weak points of the program, the minimal screen and report formatting, are there due to memory considerations and do not affect the overall operation of the program to a great degree. The price of the program seems slightly high to me, but remember, you are paying for 10.5K of program that works.

**(80 Custom Software, 5720 Brooke Lane, Sylvania, OH 43560, tape $24.94, disk $29.95)**

**Documentation For A Bare Breadboard...??**



**...You Bet Your CoCo.**

**XPNDR1™**
**CoCo Expander Card**
Gold edge connector plugs into the CoCo cartridge connector. Signals are labeled on the bottom (wire side). The 4.3 × 6.2 inch glass/epoxy card is drilled for ICs and components. Includes 8 page ***Application Notes*** which cover the basics of building hardware for your CoCo.
**$19.95** each or **2** for **$36.**

**SuperGuide™**
Precision molded plastic insert designed specifically to align and support the XPNDR1 card in the CoCo cartridge slot. Patent pending.
**$3.95** each

Available now from:
**ROBOTIC MICROSYSTEMS**
Box 30807 Seattle, WA 98103

---

*Program Quickie . . .*

## Twilight Mystery

```
10 FOR X=1 TO 4
20 SOUND 204,4
30 SOUND 207,4
40 SOUND 204,4
50 SOUND 193,4
60 NEXT X
```

# The PBH Serial Interface: Printing In The Fast Lane

By Jim Reed

The rendezvous with Dr. Doom was set for 10:30 p.m. at my place. We had plans that promised to carry us well into the wee hours of the morning. We were going to put the PBH CoCo Serial/Parallel Interface through its paces. I had my Swiss-purchased Heuer "Sebring" chronograph in readiness, but Doom winked and pointed to his Casio J-100 Pace Runner watch and wrist calculator which timed in hundreth of a *second* increments rather than my primitive one hundredth of a *minute* readout. We were going to log some serious numbers.

We were looking for some answers — and we found some. Our concerns centered on such questions as, "How much faster is 2400 Baud than 600 Baud?" and "Is 9600 Baud close to parallel speed?" and "How does the PBH device stack up?"

When you go shopping for a line printer, you will soon find out that unless you buy one of the few that have built-in serial input capability, you also need to buy a serial to parallel interface. These can sometimes be added as a factory option, but are usually less expensive if you purchase the interface as a separate device, such as the PBH CoCo Serial/Parallel Interface. The availability of such units assures you a wider range of printers to select from since most printers are designed for parallel data transmission. The CoCo, in order to hold down production cost, is produced without a built-in parallel driver.

ATTENTION CANADIAN DEALERS!

Kelly Software Distributors Ltd. manufactures and distributes software to over 100 stores throughout Canada for the following firms: Aardvark, Bob Van Der Poole, Cer-comp, Cheshire Cat, Chromasette, ColorQuest, The Computer House, Computerware, Double Density, Dr. Preble's Programs, DSL Products, Elite, Jarb, Mark Data Products, Michtron, Moreton Bay, Petrocci Freelance, Prickly-Pear, Rainbow Connection, Rainbow on Tape, Shooting Star, Silverware, Softlaw, Spectral Associates.

To provide complete dealer support, Kelly Software can guarantee fast delivery of over 500 products to anywhere in Canada. We also provide an excellent opportunity for software authors and publishers to have their products distributed to stores across Canada. Call or write immediately for further details and your free catalogue.

Kelly Software Distributors Ltd.
P.O. Box 11932
Edmonton, Alberta
T5J 3L1
(403) 421-8003

To conduct our experiment, we decided to install the PBH interface between my TDP-100 and my Okidata Microline 92 printer (which uses a standard Centronics-type parallel interface). Installation took a good minute — with most of that time spent finding a place to plug in the power supply. This note, however: The PBH interface, as delivered, is configured for Color BASIC 1.1; if you have version 1.0, you must follow the supplied instructions to reconfigure, easy to do, but it does require opening up the interface and moving a couple of push-pull jumpers.

The PBH is the nicest looking interface I've seen yet, and it seems a new brand of interface arrives at THE RAINBOW about once a week, lately. Its white finish matches my TDP-100's finish and also goes well with the newer CoCos. The labeling is attractively done and the unit has an overall professional appearance. The cables are heavy duty, with video-type DIN plugs used to connect to the CoCo and modem. The printer cable with the 36-pin Amphenol connector is a jacketed, round cable rather than the ribbon-type cable often used to connect to the printer.

A handy extra feature with the PBH is a modem/printer select switch. You need this — or some similar switch or Y-cable — since there is only one RS-232 connector on the back of the CoCo. Otherwise, you'd find yourself reaching behind your computer, plugging and unplugging cables between modem and printer operations.

In use, the PBH works without a hitch — except, as with all interfaces, you must remember to *POKE* address 150 with the value appropriate to the Baud rate you want to use, else your system "locks up" and you must then hit Reset to recover. On power up, older CoCos initialize address 150 with a value of 87, while new CoCos set the value at 88; these values are essentially the same, and both are intended to be used with 600 Baud transmission.

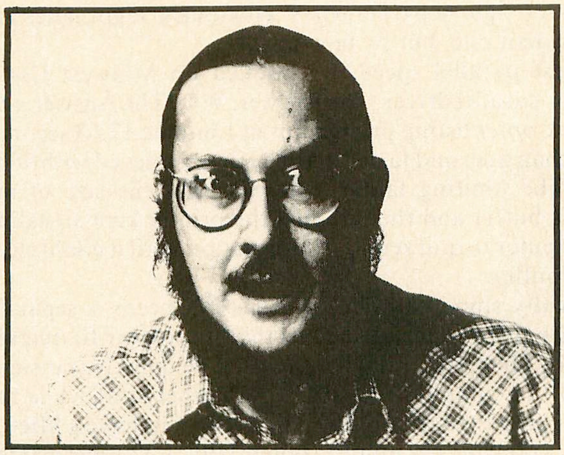
Mostly to satisfy my own curiosity, my idea was to simply *LLIST* a program (*Cavern Copter*, a 5175-byte listing from the February 1984 RAINBOW) at various Baud rates and see for ourselves how much quicker one Baud rate is than another. Then, we'd hook up a parallel driver and see how quickly the same *LLISTing* takes with it.

A technical type told me that since my Microline 92 dot matrix printer runs at 160 cps (characters per second) that we'd see little difference in printing times at Baud rates above 1200 since the printer wouldn't be able to keep up anyway. Well, we'd just see.

After a couple of false starts, due first to having the CoCo set at one Baud and the serial interface at another and then to having the PBH switch set on modem rather than printer, we made 12 printouts of *Cavern Copter*. The results are below:

| Baud | PBH | Botek |
|---|---|---|
| 300 | 3:48.21 | 3:47.83 |
| 600 | 2:11.85 | 2:11.70 |
| 1200 | 1:31.07 | 1:31.55 |
| 2400 | 1:20.55 | 1:20.48 |
| 4800 | 1:18.52 | 1:18.49 |
| 9600 | 1:17.80 | 1:18.02 |

***LLISTing* time (minutes/seconds) at various Baud rates on a given CoCo/printer setup.**



# Unleash the power of your computer!

**You've heard that line before, right? And you know that it really means "buy my program, and good luck to you."**

Well, this ad is for people who don't mind a little hard work. I'm talking to those of you who believe that owning a computer means a lot more than buying somebody's expensive software or blindly typing in magazine programs — with the fervent hope that either one will work as promised.

Am I talking to you? If so, then "Learning the 6809" should interest you. For $99 plus shipping, I'll send you my complete course in how to program the 6809 processor, the powerful heart of your Color Computer. It's just about the same course I teach in our state college system, and a better bargain because I'm always there on tape if you need to consult me.

Now listen. If you weren't born to program, then "Learning the 6809" won't do you any good. But if you've got the inclination to program and a willingness to work, then the Micro Language Lab is what you're looking for.

My 1,500-question programmed learning system is enough to teach you everything the pros know, but that's just a small part of the course. I've got 24 half-hour lessons on cassette, a 230-page book, 100 pages of data, and 35 programs that will let you — not someone else's software — "unleash the power of your computer."

If you're skeptical, write to Green Mountain Micro. I'll send you a copy of the table of contents and a sample page from the workbook. Or if you're ready to get started right away, order your Micro Language Lab by phone or mail.

*What is the ultimate all-software music synthesizer for your TRS-80 Color Computer?*
*What is the least expensive all-software music synthesizer for your Color Computer?*
*Quaver, the most realistic music experience you'll ever hear from your Color Computer!*

## COLOR QUAVER

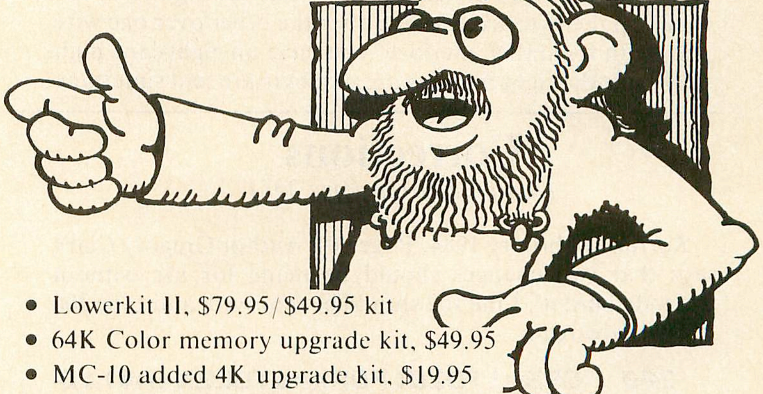
**Software Music Synthesizer**

(New Version 2.1 for 32K ECB)

**by Dennis Bathory Kitsz** author of "Custom Color"

- Real Music Synthesis — More Than Bleeps!
- Full 4-Part Harmony — In Precise Tuning.
- Versatile Editor/Compiler/Storage System.
- Entirely Software — No Hardware Needed.
- Variable Tone Qualities for Each Part.
- 64-Step Variable Envelope for Each Part
- FAST Compiler — Finished Music in 5 Seconds!
- Ready-to-Play Sample Tunes Included.

— Special Price —
Only $19.95 on tape
(Add $2.50 shipping and handling)
(Not sure? Audition Our Sample Music Tape — $4.00 postpaid)
For 32/64K TRS-80 Color Computers with Extended Color Basic.



- Lowerkit II, $79.95/$49.95 kit
- 64K Color memory upgrade kit, $49.95
- MC-10 added 4K upgrade kit, $19.95
- CoCoPort interface, $49.95/$39.95 kit
- RAM/ROM pack, $29.95/$19.95 kit
- Micro Language Lab — "Learning the 6809" — $99/$3.50 S&H
- Color Burner assembled & tested with software $69.95/$57.00 kit with software
- Scroll-A-Roll software video text display, $24.95
- TV Buff II, improved to handle virtually all monitors, $14.95

(Add $2.50 shipping and handling    Canadian orders add $1.50 more)

# Green Mountain Micro

Bathory Road • Roxbury, Vermont 05669
(802) 485-6112

see us at RAINBOWfest CHICAGO

***Continuing support for Color Computer Model I/III and 100***

COD/VISA/MASTERCARD

Dealer Inquiries Invited.

TRS-80 is a trademark of Tandy Corporation

Since a Botek serial interface was handy, we checked its performance against the PBH. As you can see from the table, the results, for all practical purposes, were identical. Differences can easily be attributed to our timing technique.

What we found was that, even on a listing of moderate length such as the one used in our test, the few extra seconds it takes to set up for a faster Baud rate pays dividends. For very long listings, you could save several minutes in printing time. In a separate test when Dr. Doom wasn't around, I found it took 11.09 minutes (my good old Swiss timing) to print *Sir Randolph of the Moors* (a very long 32K listing —27,534 bytes) at the default Baud rate of 600, but by moving up to 9600 Baud we were able to print it out in 6.04 minutes. So, yes, it's nice to have switch-selectable Baud rates.

By the way, Baud is a measure of the speed at which data is transmitted. In the CoCo, the Baud rate is equivalent to bits per second. And, since it requires eight bits plus a start and a stop bit, for a total of 10 bits, to transmit one byte, and since a single byte can represent any letter of the alphabet or number between 0 and 255, that means that 1200 Baud, for instance, translates into 120 cps.

Since my printer has a small buffer (information storage area), frequently the printer must signal the computer to quit sending information until it can print out what's in the buffer. That's why you see little improvement in printing speed at higher Baud rates — the information flow keeps being interrupted. Still, when it does flow, it flows faster —thus, the minute improvement in printout speed.

Okay, so much for sending data down a one-lane highway; you see, with serial transmission, the eight bits that make up the byte are sent one after the other over one wire. But, with a parallel interface, you have an eight-lane highway since the eight bits making up a byte are sent simultaneously over eight separate wires. Obviously, eight lanes are quicker than one, but by how much?

To test parallel speed, we hooked up Midwest CoCo Systems' parallel driver, The Answer. With The Answer, our *Cavern Copter* listing printed out in 1 minute 17.63 seconds — less than a second faster than the time achieved with 9600 Baud. The limiting factor, however, was the size of my printer's buffer and the fact that the printer kept signaling the computer to quit sending information until it could clear its tiny buffer.

To really shine, parallel transmission needs a separate hardware printer buffer such as the Microfazer to quickly dump to. Then, the entire listing could be quickly transmitted and the computer released to do other stuff while the printer completed its job. But, since few of us have a Microfazer or a 600 *line* per minute (potentially, 1,320 cps) printer such as THE RAINBOW's Mannesman Tally MT660, for our purposes, 9600 Baud, in effect, pretty much approaches parallel transmission speed.

Yes, you can transmit at higher Baud rates with the CoCo, such as 19,200 Baud by going into the high-speed mode, but, at 9600, you've pretty much reached a point of diminishing returns due to both software and hardware limitations. So, a 300 to 9600 Baud rate range, such as offered by the PBH, is all you should ever need.

In conclusion, the PBH is very well made and promises to give long, dependable service. The added feature of a modem/printer switch does add a bit to the price, but will simplify your wiring even if you've already provided some alternate switching method. It's a solid buy.

**(PBH Computer Products, Inc., P.O. Box 55868, Houston, TX 77055, $89.95)**

# Corrections

*(continued from Page 207)*

*Karrak* (February 1984, Page 90): Author Gregory Clark says that two changes should be made for use without Extended BASIC. Line 102 should be removed, and Line 200 should now read:

```
200 FORB=1TO20:FORX=1TOLEN(A$):D
$=B$(B):L=LEN(D$):IFMID$(A$,X,L)
=D$THENGOTO220
```

If you are using a 16K Extended BASIC CoCo, do a *POKE 25,6:POKE 26,1:NEW* before loading the program.

---

"A Day At The Races" (April 1984, Page 85): A printing problem caused the comma in Line 61 to look like a period. This line should read:

```
61 POKE65495,0
```

---

"Wheel Of Fortune" (April 1984, Page 138): There should be a comma after *PRINT@320* in Line 620. This is the entire correct line:

```
620 IF A<1 OR A>2 THEN GOSUB 102
0:PRINT@320,"PLEASE ANSWER 1 OR
2.":GOTO 610
```

*Hints . . .*

# RS-232 Baud Rates

These poke values for the CoCo will create the 16 most commonly used Baud rates. They are as follows:

| Baud Rate | *POKE 149* | *POKE 150* |
|---|---|---|
| 50 | 4 | 88 |
| 75 | 2 | 227 |
| 110 | 1 | 246 |
| 134.5 | 1 | 153 |
| 150 | 1 | 110 |
| 300 | | 180 |
| 600 | | 87 |
| 1200 | | 40 |
| 1800 | | 25 |
| 2000 | | 23 |
| 2400 | | 18 |
| 3600 | | 10 |
| 4800 | | 7 |
| 7200 | | 3 |
| 9600 | | 1 |

To achieve 19,200 Baud, one must use the pokes for 9600 Baud and then use the bold poke (*65497,0*) to double the CoCo's speed. Use *POKE65496,0* to restore normal speed.)

*Robert French*
*Louisville, KY*

# No Frills When You *Girdle The Enemy*

*Girdle The Enemy* is an Extended BASIC game. The object is to surround your opponent with your white line before your opponent does. Successful completion of your objective is awarded with one point. After a set number of victories, the game is over and either player #1 or #2 is declared the winner. How? By a line of type scrolling across the screen stating it. The screen flashes multi-colors and some sounds emanate from the speaker. The only option available to the players — there must be two — is a choice of levels (1 or 2). You do get to record your initials after your win. You cannot play against the computer.

I am hesitant to give this type of review, but in all honesty, there is not one feature of this program that impresses me. The sound is below average. The graphics are not up to the quality we have come to expect from CoCo software. In reality, the "graphics" consist of a black screen with a thick white line around it. This is the border of the playing field. The opponents are represented by a colored square which leaves a thick line as you move. On my screen, even though players have different colors, I had difficulty determining "who was who" once the motion began. Even though the tape did say Extended BASIC, the game is in Lo-Res, block graphics.

Perhaps two or three years ago, this game would have been suitable for a software-starved CoCo owner. While the writing style and the reproduction could use some polish, the documentation is good. In all fairness to the programmer, the game does function as described.

Considering the reasonable cost, one might consider the purchase of this game. My children point out that similar type games are available for other computer and game systems and people do enjoy playing them. If you are one of these and want no frills, then *Girdle The Enemy* is for you.

**(Microcom Software, P.O. Box 214, Fairport, NY 14450, $12.95)**

**— Bernard Roskoski**

TEST-AID ENHANCED
Item Generation and Management for Multiple-Choice Tests

CREATE, EDIT AND STORE/LOAD (TAPE OR DISK) QUESTIONS FOR MULTIPLE-CHOICE TESTS
SELECT AND ORDER ITEMS FROM YOUR OWN FILES AND PRINT FORMATTED EXAM
MENU-DRIVE COMMANDS & EASY-ENTER SCREENS
REQUIRES 32- OR 64-K AND EXTENDED BASIC

SPECIFY-- QUESTION FORMAT: 4 OR 5 ALTERNATIVES
MEDIA: TAPE ($21.00) OR DISK ($23.00)
ADD $2.00 FOR SHIPPING/HANDLING

CHECK OR MONEY ORDER TO:

INFOTOOLS
111 COUNTRY CLUB LANE
OXFORD, OHIO 45056
(513) 523-8473

# *Disktype*
# A 'Do-Little Program'

Disk BASIC's *DIR* command leaves something to be desired. The information presented is very simple and does not expand on any of the information presented. Several programs are on the market which are designed to enhance the display of information of the directory of your disk. One of these which I received to review is *Disktype* by Sunshine Software. It's a very simple program and contains only one page of instructions. Its output is to screen or printer, with the printer using the system default Baud rate (600), although the instructions tell you where to place a *POKE* to change the Baud rate.

*Disktype* uses some nice scrolling techniques when changing screens and when prompting the user to press the Space Bar to continue a display or return to the main prompt of the program. The output consists of the program name; extension; type of program, and size or start, end and exec addresses (if a machine language file). The same information can also be sent to the printer, with the program testing if the printer is on or off before it starts to print. The disk name is asked and a printout is made. There is nothing too fancy about the printout. It shows the disk name you typed in and lists the programs in the order that they are in the directory, then prints the number of free granules. When printing the machine language start, end and *EXEC* addresses, the program sometimes leaves off the first zero if the start address is less than $1000. For example, address $0E00 printed as E00, and sometimes as 0E00.

*Disktype* does not do very much, and I feel your money would be better spent on a full-blown disk utility to give you the information presented with this program, as well as a lot more. Several programs have been published in magazines for the Color Computer which give the same information as *Disktype*.

**(Sunshine Software, P.O. Box 15686, Panama City, FL 32406, $12.95)**

**— Eldon Doucet**

*Program Quickie . . .*

# Graphic Traffic

This John Dana program is one of our favorites. Type *RUN*. Hit ENTER *twice*. Key in your name. Then pound away on the space bar. Then, *RUN* again and key in a number between 96 and, say, 150 and hit ENTER. Now try the "color" keyboard.

```
1 'COLOR CRAZINESS
5 CLEAR 600
8 INPUT N
10 A$=INKEY$
15 IF A$< >""THEN A$=CHR$(ASC(A$)+N)
20 B$=B$+A$
30 PRINT B$
40 GOTO 10
```

# *Option 4* Payroll Package An Easy-To-Use Asset

*Option 4* is a Canadian payroll package that will help a small- or medium-sized company produce paychecks easily and quickly. To use this program you need a 32K Extended Color BASIC computer, an MX 80 (or other) printer, an optional tape recorder and at least one disk drive.

The documentation consists of 14 single-spaced, typewritten pages and explains how to use the program. The disk also includes sample demonstration records so the user may practice using the program before actually inputting his own data.

One of the programs on the disk is an MX 80 print routine. If you don't have this particular printer, the documentation explains how to rewrite this driver for your own printer. I had to rewrite some of the BASIC program lines to enable my printer, a Line Printer VIII from Radio Shack, to produce the checks, but had no difficulty.

You begin the program by typing *LOADM "PAY/BIN"* and then you will be requested to enter your User Code Number. If the proper password is not entered, it will ask you to re-enter it. If, however, the password is correct, you will be presented with a short graphic picture of the Canadian flag (a nice touch) and then the Payroll Menu will appear on the screen.

The first menu has seven options: a paycheck issuing program, access databases, media transfers, sort by payee/duty, sort by check number, obtain balances pay only and gross pay calculation. After selecting one of these, you are almost always confronted with another menu.

When you are ready to actually print a paycheck, it will ask you to enter a few responses about the employee's timecard, such as number of hours worked per pay period, overtime hours, etc. Next, you are asked if your printer is on and check forms are positioned properly and the paycheck will then be printed in a nice format, including a detailed stub.

The largest part of *Option 4* is the program used to update the various databases, by menu selection Access Databases. There are a total of five different databases used: employee; employer; health and benefits; child exemptions; and federal factors. Each database option has features to create a new database, add to an existing database, change the existing database, or review the existing database.

Create New Database: This will create a totally new database and will kill a previous database if it already exists. After using the demonstration data, you can create your own actual database and not have to worry about the old data remaining in the file.

Adding to a Database: This part of *Option 4* will ask you to remove the write protect tab on the disk and also whether or not you have made a backup copy. If not, then control will return to the menu. Each field allows you to enter a certain number of characters. For example, the employee name may be up to 16 characters. When you are finished entering the required data for a field, the cursor (which you never actually see) will automatically move down to the next field to be inputted. When all data has been entered, you will

AVAILABLE NOW DRAGON USER

To make the most of your new Dragon microcomputer from Dragon-Tano, you need *Dragon User* — the international, independent magazine for Dragon owners.

Each issue of *Dragon User* contains:
- reviews of the latest software
- programming advice for beginners
- hardware projects
- program listings covering games and utilities
- reviews of Dragon peripherals and add-ons
- technical advisory service
- programming articles for users

The Dragon microcomputer was launched in the UK last year. Since then we have developed a knowledge and mastery of the machine's abilities. You can benefit from our experience by subscribing to *Dragon User*, which is expanding its coverage to include all US developments.

To make sure that you receive a copy of *Dragon User* regularly, subscribe direct to us. This costs only $29.95 for 12 issues airspeeded to you — or take advantage of our special offer to long-term subscribers. Individual copies of the magazine can be obtained from your Dragon dealer.

**Subscription order form.** Receive a free book and save money by taking out a long-term subscription — a two-year subscription saves 10%, a three-year subscription saves 20%. In addition, long-term subscribers will receive a free copy of either ☐ *The Working Dragon or* ☐ *Dragon Games Master.* Please send a check, made payable to *Dragon User*, with this form.
Start my subscription from the following issue ..............................
Name ..............................
Address ..............................
..............................
Signed .............................. Date ..............................
Subscription rates US and Canada airspeeded ☐ US$29.95 for 12 issues/1 year ☐ US$53.90 for 24 issues ☐ US$71.90 for 36 issues. Send this form to *Dragon User*, % Business Press International, 205 E. 42nd St., New York, NY 10017.

be asked to verify it and the record will be written to that particular database file.

Change Existing Database: This option allows you to update or change any part of an employee's record at any time.

Review Database: The review option will ask you to enter the name of the employee and then will display that particular database's record relating to that employee. For example, if you were looking at the Employee Database, then his records would contain such information as social insurance number, personal exemption, TD1 code, hourly rate, whether or not he is married, number of pay periods per year, etc. Automatic validation of social insurance numbers, without any user involvement, is included.

After viewing the record you are given three options: you may return to the menu, select to view another record, or ask for a printout of this selected record. If you dump the record to a printer, you get an actual screen dump, that is, even the command line *PRESS (R) = MENU, (D) DUMP OR (N) NEXT* is printed. It would have been preferable to have left this out.

Media Transfers: This is a really nice feature of *Option 4* which allows you to make a backup of your datafiles. The options include disk to disk, disk to tape, and tape to disk.

Sorting: The sorting options enable you to sort by payee/duty or by check number. This function will also allow you to view the record or get a printout.

The final two selections of the Payroll Menu are obtain balance pay and gross pay calculation.

Although this is an exceptional program, it does have some drawbacks. One of these is that in order to change your password, you must pay an additional fee of 15 percent of purchase price to Your Grovelling Software and return your original disk to them on which the new password will be written. If someone who was unauthorized to have access to your payroll records accidentally discovers your password there is no way to lock them out until a new one is installed. Therefore, it would have been more advisable and less costly to the purchaser if a password routine had been included in the package.

The formatted screen and extensive error-trapping make this program easy to use, even for a newcomer to computers. Overall, I think *Option 4* is an excellent Canadian payroll package that would be a definite asset to any company.

**(YGS, Box 208, Brechin, Ontario, Canada L0K 1B0, disk $149.95)**

**— Debbie Cooper**

# The Typist's Relief: *Repeat Key*

How many times have you wished the Color Computer had the repeat key function that most of the standard terminals have? Well, with the *Repeat Key* program from Elite Software, you too can have a true repeat key function for your Color Computer.

The program comes on either tape or disk with a single 5½ by 8½-inch instruction sheet. The program is written in position independent code and, thus, can be loaded anywhere in memory. The instructions explain how to make a disk copy of the tape copy should you desire to do so. *Repeat Key* will use the upper 256 bytes of memory in your machine and require that you perform a *CLEAR* in order to keep the BASIC interpreter out of that memory area. *Repeat Key* will start repeating any key held down for longer than ¾ of a second and will repeat at the rate of 20 characters per second.

Placing the tape in the recorder and typing *CLOADM "REP-KEY"* will get the program loaded. Once the program is loaded, the standard *EXEC* command is issued. The following message is displayed on the screen.

```
* * * * REPEAT KEY * * * *

(C) 1983 BY ELITE SOFTWARE
```

This message is followed by the standard BASIC "OK" prompt. *Repeat Key* is now loaded, functional and ready to go to work. Resetting the machine has no effect upon the program. Two keys which do not repeat under *Repeat Key* are BREAK and ENTER. The program works as described and does indeed give the Color Computer the repeat key function. It requires only 256 bytes of memory which does not seem to be very much.

**(Elite Software, 201 Penn Center Blvd., Suite 301, Pittsburgh, PA 15235, $14.95 tape, $17.95 disk, $1 S/H)**

**— Frank J. Esser**

"ROOTS" GENEALOGY PROGRAM KEEPS FAMILY TREE DATA, 8 GENERATIONS: PEOPLE, HORSES, DOGS, OTHER. ASSEMBLES, ORGANIZES, PRINTS PHOTOREADY DATA. 32K EXT TAPE $20.00

"INVENTORY ONE" (ALAN ROUSE) EFFICIENT FOR BUSINESS, HOME, CLUB. TAPE = 148 RECORDS, 32K. DISK FAR MORE. PRINT STATUS, REORDER REPORTS. 16K EXT TP/DISK $30.00

"KWIK GRAF" 80-COLUMN PRINTER WITH TRS-80 MODE BLOCK GRAPHICS PRINTS PHOTOREADY BARGRAPHS. NO SCREENPRINT PROGRAM REQUIRED. EXCEPTIONAL! 16K EXT TAPE $20.00

"ADDRESS ONE" MAINTAINS ADDRESSES AND DATA. PRINTS 1-UP LABELS. SEARCH AND VIEW. 16K EXT TP/DISK $20.00

"SPEED MATH" LEARNING GAME FOR ALL AGES. FOR PLAY BY PARENTS, TEACHERS, THEIR CHILDREN 16K EXT TAPE $8.00

SPECIAL OFFER!

ADVENTURE PROGRAMS COST TOO MUCH. THEY SHOULD HAVE MORE PLOT THAN THE KILLING OF ALIENS AND MONSTERS. AS A MARKET TEST UNTIL JULY 1, 1984, WE OFFER A HIGH RES GRAPHICS ADVENTURE. ONLY MINDPOWER CAN HELP YOU FIND THE TREASURE AND ESCAPE THE VALLEY OF MYSTERY. "THE CAVE OF ALLAH" 32K EXT TAPE/DISK $20.00

WEST BAY COMPANY

W B

ROUTE 1, BOX 666
WHITE STONE, VIRGINIA 22578

POSTPAID. VA ADD 4% TAX. SEND SASE FOR PROGRAMS LIST

# Morse Code Programs Are Patient Tutors

Someone at THE RAINBOW is trying to tell me something. They keep sending me these programs to teach me Morse code. They must want me to get my ham radio license so that I will be all ready when wireless telecommunications breaks forth on the scene. To get a ham license, you have to pass a test reading the international radio language, Morse code. This is true even if you have no intention of ever hooking up key to rig once you get your license.

Now, you can sign up for a class to learn Morse code, or you can get tapes with practice drills. But a computer can be a handy and patient tutor, and a number of teaching programs are showing up on the market. Here are a couple of good ones.

Just to set the scene, when S.F.B. Morse invented the telegraph, he strung wires around the countryside — a hardwired communications network we would now say. You tapped into this network with a key and a battery. The telegraph key was a single-pole, single-throw, spring-loaded normally-open switch — a glorified doorbell button. When you pressed it, you sent a pulse of battery power over the line. This energized the magnet of all receivers hooked into the network, pulling a spring-loaded metal bar against its metal rest, giving a decided click. The point of all this is that a click is a click. By timing your keying according to Dr. Morse's code, you could send a message. The message was not in the clicks but in the silences between clicks.

When Marconi invented wireless communication, he utilized the phenomenon that you can radiate ("broadcast") a tone which can be detected by receivers in other locations. Now, put your key in line with the oscillator and you can interrupt this continuous tone to form Morse code characters. Now, communication flows through the pattern of short and long tones, usually written and referred to as dots and dashes. For effective communication to occur, the patterns must be sent accurately and consistently. The sender must develop a steady pattern of keying and the reader must learn to recognize not only the combinations which make characters, but the length of pauses between letters and words. How do you develop this faculty? Practice!

Enter the computer. CoCo and most other personal computers can generate a tone in your TV speaker. Software can provide the interruptions and translate ASCII characters into Morse code equivalents. Now you do not have to adjust your schedule to class times. You do not have to annoy the teacher by asking him to repeat certain groups that are giving you trouble. You are no longer bound by the patterns determined by the fellow who made the pratice tape. CoCo is patient, tireless and versatile.

Cynwyn's *Morse Code Teacher* and *Morse Code Tutor* utilize these virtues. Both are BASIC programs to teach you to read Morse code. *Teacher* gets you started; *Tutor* builds your speed.

When you load *Morse Code Teacher*, a graphic screen shows the traditional telegraph key and the speaker sounds out a string of CQs — the traditional call sign for, "Is there anyone out there who wants to talk?" You are then given a menu with choices. A "?" prompt will give you instructions about the choices:

1) Keyboard sending. You type a letter or number and your speaker sounds it out in Morse code, over and over until you get it right.

2) Sends you practice groups which you choose from a list. Listen to one, then the other. What are the differences? Can you always tell which is which? Practice.

3) Sends you random groups of five characters at learning speed (three to five words per minute). Telegraphy is always sent in five-character groups. Can you read them all? Can you separate the letters, the groups? Practice. You can choose to work on letters, numbers, letters and numbers, or all the code including punctuation. When using this option, you write down with paper and pencil what you are hearing; don't look at the screen until the end of the transmission. Grade yourself on accurate reading. Go back and practice the ones that are giving you trouble.

4) Exits the program as an alternative to throwing CoCo out the window when you cannot stand those "dits" and "dahs" any longer.

Once you have learned to read code accurately, your next objective is to build speed. You are ready for *Morse Code Tutor*. No more graphic title screens — this is strictly business. A string of CQs and we go right to work. *Tutor* asks you to choose the speed (three to 27 wpm) and time (one to five minutes). It then sends you a series of Vs and an "On the mark . . . get set . . ." signal and then sounds out five groups of random characters at a steady rate. You are writing these on paper with pencil as you read. At the end, the characters sent are displayed on the screen. Grade your paper. Try again. Step up your speed. Go back to a slower speed if necessary. Are some characters still giving you trouble? Back to *Teacher* for more practice. When you are reading easily at more than five wpm, call the local radio club and ask when the next license exam will be held.

I keep talking about ham licenses because this will probably be the main use of the program. Why not hook CoCo directly to the radio and let it send and read for you? This is possible, but the FCC will not let you take your CoCo to the exam. Why not use CoCo for direct wireless communication with a setup like a modem? It can be done, but you have to have a license and to get one, you still have to pass that code test.

So, practice . . . practice . . . practice. CoCo and programs like *Teacher* and *Tutor* will stick with you all the way.

**(Cynwyn, 4791 Broadway, Suite 2F, New York, NY 10034, Morse Code Teacher tape $15, Morse Code Tutor tape $15)**

**— Randy Graham**

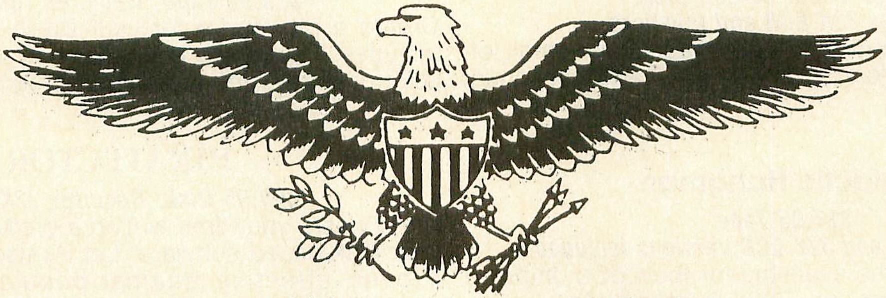
16K EXT
SLOT MACHINE
POKER
SIMILAR TO GAMES IN
ATLANTIC CITY
SEND $6.95 TO
BYE GEORGE
14 DAWSON ROAD
KENDALL PARK
NEW JERSEY 08824
RAINBOW
CERTIFICATION
SEAL

# !!! FREE !!!

Published Monthly by Computer Publishing Inc., Hixson, TN.

$1.95

Bulk Rate
U.S. Postage
PAID
Chattanooga, TN
Permit No. 357



# Color Micro Journal

The Color Computer Monthly Magazine

$1.95 per issue Vol. 1, Issue 2 *October, 1983*

## THIS 'N THAT

The **BIG NEWS** this month is that OS-9 has finally arrived for the Color Computer. The **ASTOUNDING** part of the Radio Shack OS-9 Package, besides the price, is the **DOCUMENTATION**. You 'Old Time Radio Shack Followers' will not believe what you see. Jon Shirley has been telling us that the main reason for the "lack" of documentation with a lot of their products was the restrictions placed on releasing that information by **Microsoft**; I

## OS-9 on the COLOR COMPUTER

One of the "Operating Systems of the Future" is **now available** for the "little old Color Computer"; **OS-9**. Freely translated, OS-9 means "Operating System for the 6809" (OS-9 is now being written for the **68000**, also). Since it is fairly obvious that UNIX and "UNIX-Type" Operating Systems will be running on just about every computer to come out in the next few years, a whole new language is beginning to appear on the horizon.

**Color Computer OS-9; the Package**

We had been running a preliminary release of OS-9 on the Color Computer for a few weeks, and received the "Official Radio Shack" version for Review a couple of days ago. To put it mildly, this package is **IMPRESSIVE!** For $69.95 (Radio Shack Catalog Number **26-3030**), you receive a 9 1/2" x 7 5/8" x 2" package containing 4

# FREE SAMPLE ISSUE

## 1-800-338 6800

MON.-FRI. 9-5 E.S.T.

USA-$12.50 per year. Canada& Mexico-$19.50 per year

Surface Foreign-$24.50 per year. Airmail Foreign-$48.50 per year

# Color Micro Journal™

TM Color Micro Journal is a trademark of Computer Publishing Inc.

5900 Cassandra Smith Rd.
Hixson,TN. 37343

Sugar Software

# Tried and True . . . . . . . . .

## EDUCATIONAL

### PreReader

***$19.95 Tape; $24.95 Disk.***
***Requires 32K ECB and joysticks.***

Age 3-5 reading readiness skills; capital and small letters; numbers; colors; shapes; letter and consonant blend sounds.

### Galactic Hangman

***$17.95 Tape***
***Both 16K ECB and 32K ECB versions included.***

Best hangman game available for the CoCo. Improve your vocabulary, spelling. 700 words included, or use your own words.

### The Great USA

***$19.95 Tape***
***Both 16K ECB and 32K ECB versions included.***

Challanging game of the 50 states. Appreviations; capitals; state nicknames; trees; flowers; birds. User modifiable input.

### Silly Syntax

***$19.95 Tape; $24.95 Disk.***
***$49.95 Disk with 62 stories***
***Requires 16K ECB.***

Laugh and learn parts of speech and reading skills. Create your on stories with the built in word processor.

### Bible Stories Adventure

***$19.95 Tape; $24.95 Disk***
***Requires 16K ECB.***

Familiar Bible Stories in graphics adventure format. Cross the Red Sea with Moses and throw stones at Goliath.

### STATGRAF

***$24.95 Tape; $29.95 Disk***
***Requires 32K ECB.***

Our linear regression analysis package combined with high-resolution plotting/line graphing. Enter up to 250 pairs of (x,y) data, 5 data sets on a single graph, transform observations.

## UTILITIES

### AUTO RUN

***$19.95 Tape; Requires 16K ECB.***

Create a ML loader for your Basic or ML programs. Includes a graphics editor so that you can create a colorful title screen for all your programs.

### PIRATECTOR

***$99.95 Disk; Requires 32K ECB.***

Don't waste your time writing a protection scheme for your disk-based software. Let Piratector do it for you! Proven effective against popular "cracking" or duplicating programs now on the market. Includes Semigraf graphics editor and user functions to make your programming easier.

### SEMIGRAF Graphics Editor

***$19.95 Tape; $24.95 Disk***
***Requires 16K.***

Uses the little-documented semigraphics modes of the Color Computer — 8 colors; combine text with graphics; letter set; auto repeat; menu-oriented; includes sample pictures.

see us at RAINBOWfest CHICAGO

## INFORMATION MANAGEMENT

### TIMS

***$24.95 Tape***
***Requires 16K ECB, 32K ECB recommended.***

The most database for the money for the CoCo. Keep all files, rosters, lists; 8 user definable fields; sorts on 3 fields; item search; range search; upper and lower cases; user-selected print formats. Disk compatible.

### TIMSMAIL

***$19.95 Tape. Requires 32K ECB.***

The ultimate mailing list manager for the CoCo. User friendly and user proof; send your mailing list to printer, tape or disk; designed for 80 column printer; continuous or single sheet; 1, 2 or 3 labels wide; 2.5, 2.75, 3, 3.5 and 4" labels; select records to print.

---

Sugar Software No. ________
**Gift Certificate**

Pay to the order of ________ available in ________
Amount ________ any amount!
Memo ________

A complete catalog of other sweet Sugar Software products is available.

SUGAR SOFTWARE
2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

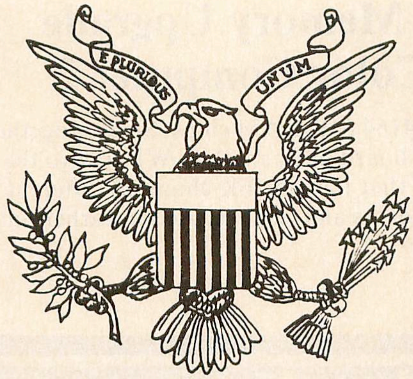
MasterCard VISA

Add $1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374. Dealer inquiries invited.

Sugar Software

# . . . . . . . . . Something New!

## The Presidents of the United States



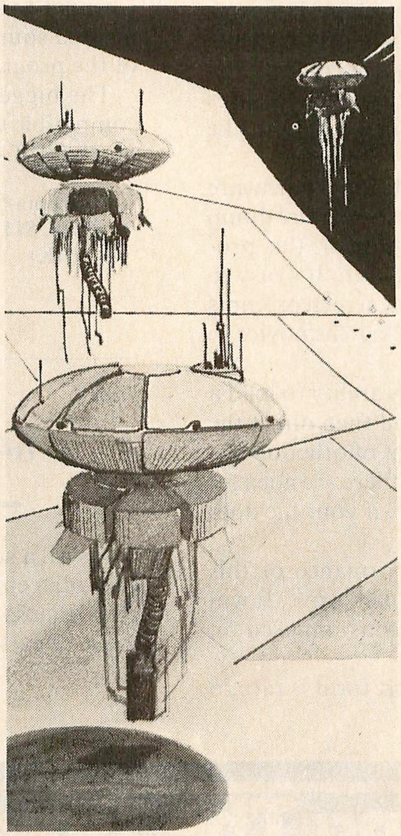
**16K, 32K Tape - $24.95**
**32K Disk - $29.95**

Who was the only Eagle Scout to become President? Which President had the shortest term of office? Which President later became Chief Justice of the U.S. Supreme Court?

**Find out** with the great new educational game **The Presidents of the United States.**

- Grades 5 and up
- Study mode
- 2 separate games
- User-modifiable data
- 100% Machine Language
- Menu-oriented
- Up to 8 players

see us at RAINBOWfest CHICAGO



## Flying Tigers

**16K Tape - $24.95**
**32K Disk - 27.95**
**Joystick required**

Somewhere in the far future, while flying home from an alien skirmish, your squadron of Warhawk II's is ambushed by aliens from hyperspace. In the battle that follows, all 10 of your wingmates are shot down. They eject to relative safety on a small asteroid. ***YOU*** are their only defense as the aliens close in for the kill!

- 100% ML
- Arcade quality
- 5 levels of difficulty
- Super hi-res graphics and animation
- Sensational space sound effects
- Skill and strategy needed

## The CoCo Calligrapher

**32K ECB Tape - $24.95**
**32K ECB Disk - $29.95**

Turn your CoCo into a calligrapher's quill. Three separate print styles! Upper and lower case!

Gay Ninety
7890ABCD
NOPQRSTU
efghijklmnop
wxyz.,!?-:;'"()

Requires a Bit Mode Printer. Works with Epson, Okidata, Gemini 10X, R.S. Line Printer VII, DMP 100 or equivalent.

Old English
90ABCDE
NOPQRS
abcdefghijkl

36 point (1/2 inch) letters are variably spaced — great for flyers, invitations, signs, etc. Input up to 17 lines of text at a time; save and retrieve data.

Cartoon
7890ABCDEF
RSTUVWXYZa

# *Spooler* Provides A Good Printer Dump

*Spooler* from Chroma-Systems is a machine language utility that allows you to output a file to the printer while retaining limited use of your computer. A great concept, but it contains the limitations of all software spoolers; it uses precious RAM. This is especially critical in a machine like the CoCo with only 64K total.

If you *need* a spooler then you *need* additional hardware that is truly a spooler and will store (spool) your entire dump to the printer. If you can use a software spooler, this program from Chroma is the best of those I've seen. It's easy to load and even easier to use. The instructions, screen prompts and built-in default values all combine to allow the novice to utilize the functions of this program.

The main advantages of *Spooler* lie in its ability to load a file to be printed into a buffer in RAM and then direct the output of this buffer to printer independent of other operations. You can run most BASIC programs if there are not a lot of special pokes. You can perform disk I/O if your file does not exceed the buffer length.

The best equipment to utilize the performance of this spooler is a 64K machine with at least one disk drive. It will work with a 32K machine but the restrictions imposed on the system all but exclude disk I/O.

I am very concerned in writing this report for it is rare to review a program as well done as *Spooler*, and yet not be able to cite all sorts of uses for it. It is a strong commendation to look to Chroma-Systems for other software.

The operation of *Spooler* is remarkably easy. You are required to run a BASIC loader program, which will get you to the program setup menu. One time through selecting the default values and you're off and printing and computing. Chroma-Systems has also included an extensively documented source code which by itself is almost worth the cost of the program in terms of learning assembly code.

The biggest obstacle in utilizing *Spooler* is that it is not compatible with any of the major word processing programs for the CoCo.

**(Chroma-Systems Group, P.O. Box 366, Dayton, OH 45420, $11.95 cassette, $15.95 disk w/source code, 16K, 32K or 64K)**

**— Ed Sehlhorst**

---

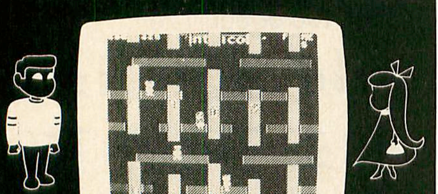
*Hints . . .*

# 64K Memory Upgrade — Color Computer 2

Install a set of 4164 64K RAM chips. Solder together the two adjacent PC board holes marked W1 next to the 6822 chip. Please note that the old 16K chips are different from those in earlier CoCos and can't be used in earlier units.

**Setting The Standards**

**CANDY CO.**



Graphics and sound effects like never before on the CoCo. An exciting original arcade action game. Control your hero through a maze of moving conveyor belts. Outsmart bad guys and save Q.P. Doll. Over 1,000 frames of increasing difficulty.

100% ML, original title screen music, 1 or 2 players, colorful Hi *Res graphics*, exciting sound effects, joystick or keyboard input, pause feature, 8 digit scores and high score name entry. For **32K** CoCo and TDP-100.

**Cassette-34.95** **Disk-34.95**

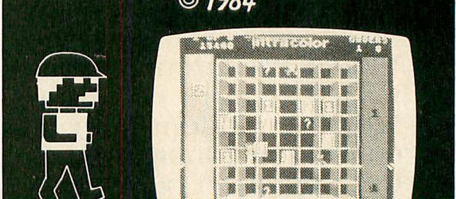
intracolor
Grand Prix

Strap yourself into the ultra responsive Formula I car and rev the throttle to fire 500 screaming horses to life. Your heart pounds in anticipation of the race. The green flag drops and you are slammed back into your seat as the field thunders off in a deafening roar.

An exciting racing game in colorful Hi Res graphics with realistic sound effects. Joystick or keyboard input. Joystick input is compatible with all joysticks. Many different tracks to choose from. For **32K** CoCo and TDP-100.

**Cassette-34.95** **Disk-34.95**

**Willy's WAREHOUSE**
© 1984



Another exciting original arcade action game. Help Willy stock the warehouse while keeping up with incoming orders. Watch out for the antagonists who intend to make your day long.

Excellent graphics and sound effects. 100% ML, 1 or 2 players, demonstration mode, selectable difficulty, joystick or keyboard input, pause feature and high score list with *name entry*. For **32K** CoCo and TDP-100.

**Cassette-34.95** **Disk-34.95**

**COLORPEDE**

This truly outstanding engineer designed, 100% ML game with multi-colored Hi Res characters and fast action will challenge the most avid arcade buff. 1 or 2 players with joysticks or keyboard. **COLORPEDE** slithers through the toad stools. Demonstration mode with top 5 scores. Pause feature. For **16K** CoCo and TDP-100.

***Casssette-29.95*** **Disk-34.95**

"...forefront of the pack..." **RAINBOW**, Dec. '82

RAINBOW CERTIFICATION SEAL

**ROBOTTACK**

You are the super human who must fight off the attacking robots and save the remaining humans from destruction. You have super human powers, can shoot in any direction and move anywhere on the screen to accomplish your vital mission.

Engineer designed, 1 or 2 players and top 5 scores displayed. Pause feature. For **16K** CoCo and TDP-100 with joysticks.

**Cassette-24.95** **Disk-27.95**

**AT YOUR DEALERS NOW.**
From **INTRACOLOR:** VISA, MASTERCARD, Money Order. Please allow 2 weeks for checks. Add 1.50 for shipping, 3.00 outside U.S. 4% tax in MI.

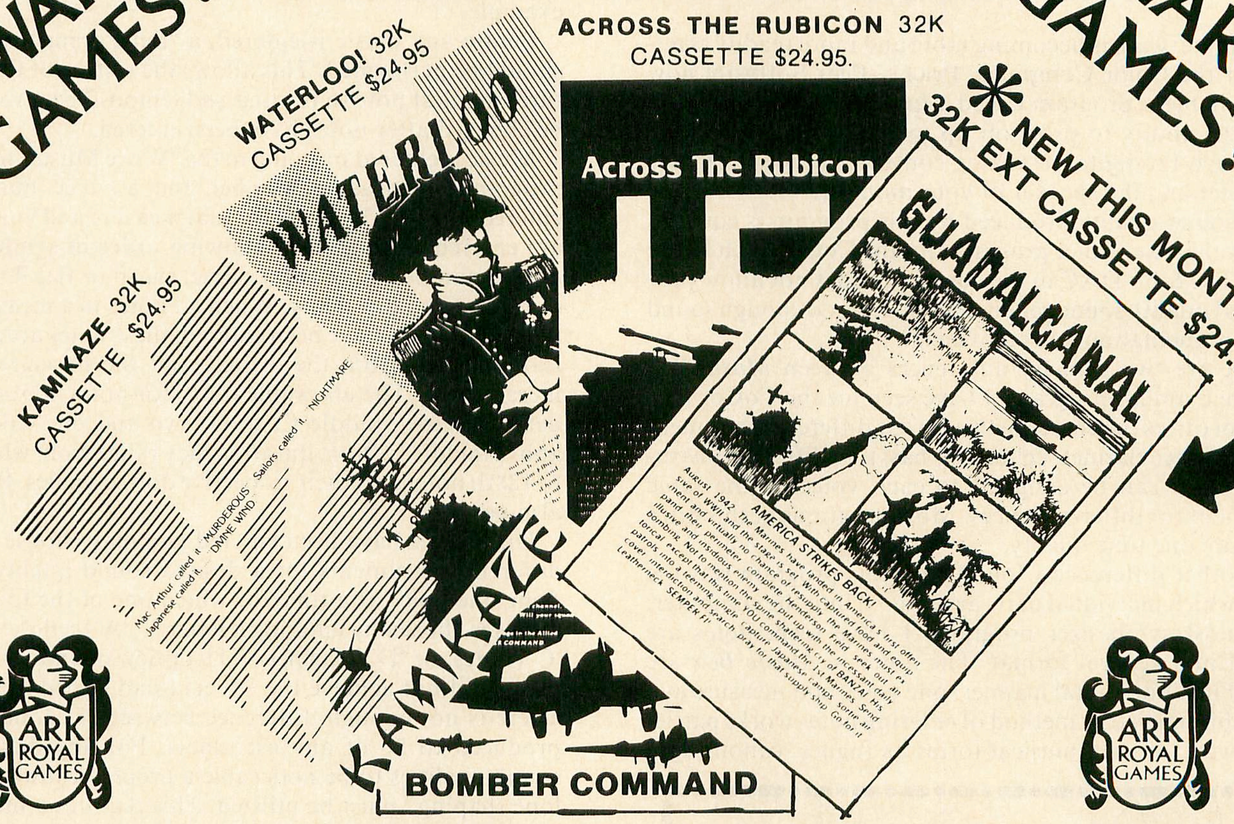
**intracolor**
**P.O. Box 1035, East Lansing, MI 48823 (517) 351-8537**

**DEALER INQUIRIES INVITED** **QUALITY PROGRAMS SOLICITED**

# WE CHALLENGE YOU!

WAR GAMES!

WAR GAMES!



Mac Arthur called it "MURDEROUS". Sailors called it "NIGHTMARE". Japanese called it "DIVINE WIND".

AMERICA STRIKES BACK!

August 1942. The Marines have landed in America's first offensive of WWII and the stage is set. With captured food and equipment and virtually no chance of resupply the Marines must expand their perimeter, complete Henderson Field, seek out an illusive and insidious enemy and put up with the incessant daily bombing. Not to mention the spine shattering cry of BANZAI! Historical except that this time YOU command the 1st Marines. Send patrols into a teeming jungle, capture Japanese camps, sortie air cover interdiction and search, pray for that supply ship. Go for it Leatherneck SEMPER FI!

**WATERLOO!** 32K CASSETTE $24.95

**ACROSS THE RUBICON** 32K CASSETTE $24.95.

* NEW THIS MONTH! 32K EXT CASSETTE $24.95

**KAMIKAZE** 32K CASSETTE $24.95

**BOMBER COMMAND** 16K EXT CASSETTE $22.95

ARK ROYAL GAMES

ARK ROYAL GAMES

ARK ROYAL provides three types of game: The Strategy Wargame, Strategy Arcade and Arcade games.

DEALER DISCOUNT AND COLOR DISPLAY PACKAGING AVAILABLE. WE CARRY UTILITY SOFTWARE, TOO!

## *OTHER ARK ROYAL GAMES...*

**GALACTIC TAIPAN** 32K EXT Battle storms, pirates and high taxes in hopes of making a profit in the galaxy. CASSETTE...$24.95.

**MISSION EMPIRE** 32K EXT cass or disk. Starting with one planet, incomplete intelligence and limited resources, you must form alliances, build armies and conquer the galaxy. Game save. Cass or Disk version on Cassette...$24.95.

**STARBLAZER** 32K EXT During your absence, the SPECTRUM galaxy has been overrun by the draconic xyclons. Now you command the only Starship left to retaliate. CASSETTE...$24.95.

**LASER SUBS** 16K (Suited for kids, 12 and under). Hi-res graphics. Lots of fun — kids love it! Your destroyer discovers a fleet of enemy's laser-firing subs heading towards the surface. Destroy them with depth charges before they blast you apart. Joysticks. CASSETTE... ***(SPECIAL) $10.00***

**CRYSLON** — 32K 3-D graphics, joysticks. Player commands the remote-controlled defense missiles of the planet Cryslon. Your mission — defend the planet's cities from invading aliens with powerful lasers. CASSETTE... ***(SPECIAL) $10.00***

**P. O. Box 14806**
**Jacksonville, FL 32238**
**904 777-1543**

Prices on All games include shipping. Florida Resident add 5% tax.

Orders are shipped the day they are received regardless of check or money order. Send no cash, please. We pay shipping on all prepaid orders. On C.O.D.'s, customer pays charges No bankcard sales. We have enough paperwork already.

All games strategy oriented, graphically portrayed and guaranteed from defect and boredom. For DISK version add $3.00. No mail delays with personal checks. State system with order.

All Programs require Color ComPuter™ (Tandy Corp) or TDF System 100 ComPuter™ (RCA)

# *Music Box* Gives You Voices With Choices

Music software is becoming more and more readily available for the Color Computer. Prickly-Pear Software now has available a program called *Music Box*. This program offers the ability to program up to a four-voice harmony using the 6-bit digital to analog converter inside the Color Computer and the speaker of your monitor.

The sound quality produced by this program is equal to that of other four-voice programs for the CoCo which I have heard. The 6-bit DAC in the computer does not allow professional quality sound, but it does offer good enough sound for experimentation and enjoyment.

There are two primary differences between *Music Box* and other similar programs I have seen for the CoCo. This program offers the choice between four different instrument sounds (flute, clarinet, cello, and bass). A different instrument sound can be assigned to each voice or the same instrument for different voices. Most programs at this price offer only one tone quality.

The other difference I found with this program was the way in which individual parts are entered into the computer. With most synthesizer programs I have seen, notes are entered in a vertical format. The notes in *Music Box* are entered in a horizontal manner, one voice and measure at a time. This particular method of entering notes works particularly well for such musical forms as fugues, canons, and any other contrapuntal forms.

THE OTHER GUY'S Software
KEEP—TRACK
"Double-Entry" General Ledger Accounting System
for Home or Business on 16K, 32K or 64K.
This user-friendly MENU driven system comes complete
with operator's manual and sample printouts.
★★★ PROGRAM FEATURES ★★★
•Balance Sheet • Income & Expense Statement (current year-to-date categories "YTD") • General Journal & General Ledger •
This system handles 2400 "Journal Entries" on the 32K & 64K versions. The 16K version can handle up to 740 records.
1 diskdrive, printer & at least 16K with ECB required.
COMPARE FEATURES & PRICE, then BUY "THE OTHER GUY'S"
INTRODUCTORY OFFER ~~$69.95~~ $14.95
Manual with sample printouts $10.00 (can apply toward purchase)
WE ARE "THE OTHER GUY'S SOFTware"!
AMT • Full Featured Amortization Program
★★★ This one does it all — Look at these features ★★★
This program will compute monthly, bi-monthly, quarterly, semi-annual, or annual payments using positive or negative amortizations (useful for calculating new loans such as FHA 245, GPARM & ARM). It will also calculate BALLOON PAYMENTS. Up to 12 months can be viewed on the screen including: payment number, interest, principle, and balance. Printing will produce the above output PLUS title block, total interest to date, total principle to date, & total amount paid to date. (Instruction book included) This program is fully "MENU" driven and user-friendly. Requires 16K ECB — Tape or Disk.
INTRODUCTORY OFFER ~~$29.95~~ $14.95
DEALER INQUIRIES INVITED.
(add $1.50 for postage and handling)
Send check or money order, US funds to:
THE OTHER GUY'S SOFTware • 875 S. Main • Logan, UT 84321
Phone: (801) 753-7620

When *Music Box* is first loaded, it will play a four-voice fugue by J.S. Bach. All that is needed is to type and enter *EXEC* and then select option 1 (Play Music). A short tutorial is provided for entering music on Page 4 of the manual. The first six measures of "Yankee Doodle" are used as an example.

Before any music is entered, a "Set Parameters" option should be performed. This allows the setting of time signature, smallest note to be used and tempo. These values may be changed after notes have been entered.

Music is entered by going to the "Write Music" part of the program. A measure number and a voice number are entered followed by notes for that measure and voice. Notes are entered through the following order of symbol entry: octave number, note letter name, sharp or flat if any, note duration, and dot if any. When all notes in a measure for a particular voice have been entered, these notes are automatically cleared from the display and the measure number incremented. The allowable range for notes is from C, two octaves below middle C, to G, two and one-half octaves above middle C. Note duration may range from whole notes to 128th notes and their respective dotted values. Rests may also be used.

Once notes have been entered you may choose from the different instruments for a desired sound quality. This is done one voice at a time for which one of the four instruments is chosen by entering a letter — 'A' (cello), 'B' (bass), 'C' (flute), or 'D' (clarinet). The option of choosing instruments did not achieve the effects I had hoped they would. There is not enough difference between the tone qualities produced to be of any usefulness. For any difference in sound qualities to be noticeable a process known as "envelope shaping" must be utilized. This requires a much more involved program than is provided by the *Music Box*.

An "Examine Music" option allows one to view notes after they have been entered, one voice and measure at a time. This is quite useful when looking for errors, however, an editing mode is not provided. If an error is detected, you must return to the "Write Music" option and rewrite that particular voice line for the whole measure. This procedure can be quite annoying especially if 16th notes in $^4/_4$ time are being used.

An interesting option provided is that the music may be played backwards if so desired. This does not have any practical function; however, it can be highly entertaining.

The most enjoyable part of reviewing this program for me was the "Write Music" option. The author has provided an easy-to-use method for entering individual notes. This is the best solution to the problem of how to enter musical symbols from a computer keyboard that I have seen so far.

If you are interested in experimenting with music generation on your CoCo above and beyond that which is provided by Extended Color BASIC, then I highly recommend your consideration of using the *Music Box*. Its method of entering music is quite functional; however, editing can be a problem. Its price and sound quality is equal to similar programs within the same price range. An important feature is that once notes are entered, listening to the music is as quick and simple as pressing a button.

**(Prickly-Pear Software, 8532 E. 24th Street, Tucson, AZ 85710, tape $24.95)**

**— Larry Konecky**

INVESTIGATE THE HIDDEN REALMS
OF THE HUMAN MIND!!

## *BIO-PSYCHOMETER*™

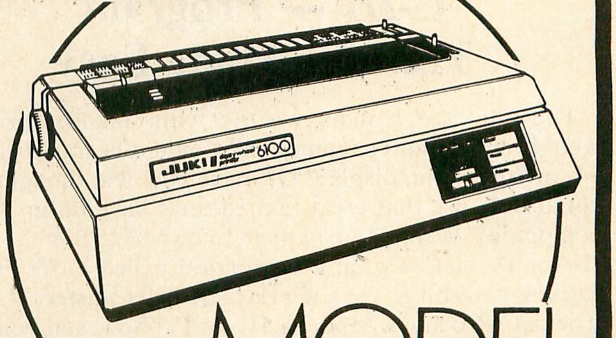
* Authentic Bio-feedback device and software
* Machine Language, high speed graphics
* Includes:
  Bio-feedback graphing,
  Stress Reduction, and
  Memory Improvement modes
* Very sensitive hardware for optimum results
* Requires 32K & Ext. BASIC
* With manual, only....$ 39.95

IF YOU HAVE EVER HAD TROUBLE MAKING UP YOUR MIND, THEN THIS PROGRAM IS FOR YOU

## *DECISION MAKER*™

* A step by step interactive program to help you solve your problems
* Designed to use standard analytic techniques
* Works with any problem
* A valuable tool for anyone
* Requires 32K & Ext. BASIC
* Now, only...........$ 24.95

## JUKI®



MODEL 6100

NOW AVAILABLE AT

**$539.00** WITH SERIAL INTERFACE

---

LETTER QUALITY
BI-DIRECTIONAL
DAISYWHEEL PRINTER

PRINTING SPEED OF 18 cps
PROPORTIONAL SPACING MODE
UTILIZES IBM SELECTRIC RIBBONS
WORD PROCESSING AND GRAPHIC FUNCTIONS
100 CHARACTER DAISYWHEEL, 10/12/15 PITCH
CODE COMPATIBLE WITH DIABLO 620/630
COMPATIBLE TO TRS-80 COLOR COMPUTER,
IBM PC, APPLE, TRS-80 MODEL III & 4, ETC.
ALSO AVAILABLE WITH PARALLEL INTERFACE
REGULARLY $599.00 NOW ONLY **$499.00**

## *COLORFORTH*™ *V2.0*

* The original **COLORFORTH** Compiler is now even better
* **COLORFORTH V2.0** can access ALL available RAM - 16K through 64K
* **COLORFORTH** is at least 10 to 25 times faster than BASIC
* 50 words are included in addition to the standard figFORTH commands
* This package includes BOTH cassette and R/S DOS versions PLUS a resident figEDITOR, and 82 page manual
* Rated "BEST BUY" of Color Computer Forths reviewed by COLOR COMPUTER MAGAZINE, July 1983. (Version 2.0 is an even better buy)
* All of the above, for only..................................$ 49.95

Add $2.50 shipping & handling Texas residents add 5%
We accept U.S. funds on U.S. banks, VISA & MASTER CARD, & UPS C.O.D.s.

**DEALERS INQUIRIES WELCOME**

**ARMADILLO INT'L SOFTWARE**
P.O. BOX 7661
AUSTIN,TEXAS 78712

VISA MasterCard

PHONE (512)835-1088

# *C-III* — Program Transfer Made Easy

Did you ever wonder whether your favorite program would run on another computer? Could it be modified for a 64- or 80-column display? Or, have you ever thought, "If I could only use that great text editor I have on my 'other' computer?" Well, if you happen to own a TRS-80 Model I, III, or IV, a CoCo, and a program called *C-III* by Tim Purves, you can give it a whirl. *C-III* will transfer files to or from a CoCo and a Model I, III, or IV; however, you must provide any necessary program conversions in order for it to be run.

Actually, *C-III* is two programs on a single density "small kernel" MultiDOS disk: *C-I* for the Model I and *C-III* for the Model III. *C-III* itself must be transferred, using the Model III "convert" utility, to your own operating system disk. Having a Model I and a CoCo, I will limit this review to the *C-I* version only.

The package comes with a single density, 35-track diskette containing both programs and the small kernel MultiDOS system. The original two-page instruction manual had one major shortcoming: it failed to mention the fact that you must use the program extension of "/ASC" for a BASIC file and it must be in ASCII format before transfer. Machine language files should have an extension of "/BIN." The instruction manual being distributed in the current package has been updated to add this information and is now quite adequate.

Also mentioned in the new manual is the fact that a double density modification kit of some type is required for a Model I. MultiDOS is used in order to provide compatibility with most double density modification kits. The remainder of the manual covers the three options available on the *C-I* menu screen.

The three available options are as follows:

1) Get Color Computer disk directory
2) Copy from color disk to TRS-80 disk
3) Copy from TRS-80 file to a color disk

The program is incredibly simple to operate and completely self prompting. Option 1 simply displays the directory from a Color Computer disk. This must be done from drives 1 to 3 since the MultiDOS system disk must remain in drive 0.

Choosing option 2 brings about a series of prompt messages. The first is a request for the drive number of the color source file. Again, this must be drives 1 to 3. You are then requested to insert the source disk into the drive chosen and press ENTER. A color disk directory is displayed and you are asked to input the source filename. The next prompt requests the TRS-80 destination drive number, 0 to 3. The final prompt requests a destination filename or press ENTER to use the source filename.

Option 3 provides the same prompts as option 2, except you may not copy to a disk in drive 0 since the MultiDOS disk must remain there.

The program works properly most of the time. The only bug found so far is one that causes the first sector of the file being transferred to be missed and the second sector transferred twice. This occurred every time I tried to transfer a file from the *C-III* MultiDOS disk and that file began on sector 5 of any track. After relocating the file to begin on sector 0 of any track on the same disk, *C-III* worked fine. The author has been made aware of this problem and believes it is caused by the special small kernel MultiDOS system. The bug is not present when used with the full MultiDOS system. At the date of this review, I have not yet heard whether or not this problem has been corrected.

In conclusion, *C-III* is an excellent transfer utility. If you do not mind making a couple of attempts to transfer your program, it can save many long hours of typing. If you type like I do, this can be a life saver.

**(MichTron, 1691 Eason, Pontiac, MI 48054, $24.95)**

**— Larry Birkenfeld**

F-16 INSTRUMENT FLIGHT SIMULATOR
An exciting simulation of instrument flight with full panel and "heads up" display. Specify 16 or 32/64 K $21.95 + $1.00 S&H

TSPOOL
A software spooler for Telewriter-64. Optional descenders for DMP-100 / Gorilla Banana printers. For 32/64K specify printer $24.95 + 1.00 S&H

DESCENDERS
Graphic lowercase descenders for LPVII /DMP-100 printers. For use with Basic (16/32/64K) or Telewriter-64 (32/64K) only. $17.95 + $1.00 S&H

TELEWRITER-64
The BEST word processor you can buy. Save 15% on our TSPOOL or Descenders if you order in combo with Telewriter-64. $49.95 Tape $59.95 disk

COD and CREDIT CARD orders gladly accepted
9am to 5pm EST (813) 321-2840

KRT Software Inc
P O Box 41395
St Petersburg, Fl 33743

16K ADVENTURE GENERATOR .......... TAPE $19.95
Create your own adventure with this program. Should be familiar with proper basic syntax to use. Writes adventure game directly to tape.
16K ADVENTURE STARTER PACKAGE ... TAPE $14.95
Three graduated adventure games designed to guide you from beginner to tackling the expert level adventure games with confidence.

SOFTECH
P.O. BOX 3330
Cheyenne, WY 82003

see us at RAINBOWfest CHICAGO

# ENDICOTT
## COMPUTER SOFTWARE AND ACCESSORIES

**NEW** **PRICES**

### PRINTERS
(SEE PRINTER INTERFACE BELOW)

| | |
|---|---|
| SPIRIT (SAME AS MX80) | $339.00 |
| OKIDATA 8 2A | $329.00 |
| GORILLA/BANANA | $235.00 |
| —(SERIAL WITH CABLE) | $255.00 |
| —(PARALLEL WITH INTERFACE) | $299.00 |

**NEW** **PRICES**

### MONITORS
BY AMDEK

(SEE MONITOR INTERFACE BELOW)
ALL WITH NONGLARE SCREEN.

| | |
|---|---|
| COLOR 1+ | $315.00 |
| VIDEO 300(G) | $150.00 |
| VIDEO 300(A) | $165.00 |

### ENDICOTT JOYSTICK
$19.95.....EACH $37.95.....FOR TWO

"In use, we found the ENDICOTT JOYSTICK to be smooth and responsive. ...built to last, the Endicott model is a solid buy". *the RAINBOW, October 1982*

"...provided the best feel of all the joysticks tested. ...(a) rugged unit at an affordable price."
*-80 micro, March 1983*

### PRINTER INTERFACE
**pbh SERIAL/PARALLEL**

SWITCHABLE: 300 TO 9600 BAUD.
PRINTER *AND* MODEM CONNECTIONS.
NOTHING ELSE REQUIRED.

~~$89.95~~ $79.95
PURCHASED WITH PRINTER .... $64.00

### MONITOR INTERFACE

| | |
|---|---|
| VIDEO PLUS (COLOR OR MONOCHROME) | $24.95 |
| PURCHASED WITH MONITOR | $20.95 |
| VIDEO PLUS IIM (MONOCHROME FOR COLOR II COMPUTER) | $26.95 |
| PURCHASED WITH MONITOR | $22.95 |

VIDEO PLUS IIC (AVAILABLE SOON)
(COLOR FOR COLOR II COMPUTER)

### BLANK MEDIA

| | |
|---|---|
| ELEPHANT SSSD | $20.95 |
| ELEPHANT SSDD | $23.95 |
| ELEPHANT DSDD | $28.95 |
| C-10 CASSETTES (10 FOR) | $ 7.50 |

### MEDIA STORAGE TAPE
TAPE CAROUSEL (HOLDS 25) ... $13.00

### DISKETT

| | |
|---|---|
| FLIP'N'FILE 10 | $ 5.45 |
| FLIP'N'FILE 25 | $24.95 |
| FLIP'N'FILE 50 | $33.95 |

### SUPER-PRO KEYBOARD
*BY:* MARK DATA

ADAPTER REQUIRED ON
COMPUTER BOUGHT AFTER 10/82.
KEYBOARD ........ ~~$69.95~~ $59.95 ADPT. $4.95

### VOLKSMODEM
*BY:* ANCHOR AUTOMATION
300 BAUD, DIRECT CONNECT
MANUAL ANSWER,
MANUAL DIAL
INCLUDES CABLE $74.95

### SURGE/SPIKE SUPPRESSOR & EMI/RFI FILTER
*BY:* KALGLO

| | | |
|---|---|---|
| DELUX: 8 SWITCHED SOCKETS, FUSE, LIGHT, 8' CORD | ~~$89.95~~ | $79.95 |
| MINI: 2 SOCKETS, LIGHT, PLUG IN | ~~$44.95~~ | $40.95 |

## Look at These Discounts and Compare...Remember WE PAY SHIPPING!
*SOFTWARE PRICES SHOWN ARE* **20% OFF** *LIST PRICE!*

### CUSTOM SOFTWARE ENGINEERING

| | |
|---|---|
| DISK DATA HANDLER (Data Base) | $43.95 (Supplied On Tape) |

### SPECTRAL ASSOCIATES

| | T | D |
|---|---|---|
| ▷ CUBIX | $19.95 | $23.15 |
| ▷ LANCER | $19.95 | $23.15 |
| ▷ MS GOBBLER | $19.95 | $23.15 |
| WHIRLYBIRD RUN | $19.95 | $23.15 |
| STORM ARROWS | $19.95 | $23.15 |
| LUNAR ROVER PATROL | $19.95 | $23.15 |
| SPACE RACE | $19.95 | $23.15 |
| SPACE SENTRY | $15.15 | $18.35 |
| PLANET INVASION | $19.95 | $23.15 |
| ALPHA SEARCH | $19.95 | $23.15 |

### COMPUTERWARE

| | T | D |
|---|---|---|
| ▷ JUNIOR'S REVENGE | $23.15 | $25.55 |
| ▷ TIME PATROL | $19.95 | $22.35 |
| ▷ HYPER ZONE | $21.55 | $23.95 |
| ▷ COLOR BASIC COMPILER | | $31.95 |
| 64K SCREEN EXPANDER (64K) | $19.95 | $22.35 |
| * THE SOURCERER | $27.95 | $31.95 |
| ▷ DISK MACRO ASSEMBLER & XREF | | $39.95 |
| ▷ COLOR EDITOR | $19.95 | $23.95 |
| ▷ COLOR MONITOR | $19.95 | $22.35 |
| ▷ MOON HOPPER | $19.95 | $22.35 |
| BLOC HEAD | $21.55 | $23.95 |
| DOODLE BUG | $19.95 | $22.35 |
| SHARK TREASURE | $19.95 | $22.35 |

### SOFT LAW

| | T & D INCLUDED | |
|---|---|---|
| ☐ VIP WRITER | $47.95 | — — — |
| ☐ VIP SPELLER | $31.95 | — — — |
| ☐ VIP CALC | $47.95 | — — — |
| ☐ VIP TERMINAL | $39.95 | — — — |
| ☐ VIP DATA BASE | $47.95 | (DISK) |
| ☐ VIP DISK-ZAP | $31.95 | (DISK) |

### ELITE SOFTWARE

| | T | D |
|---|---|---|
| ☐ ELITE-WORD | $47.95 | $47.95 |
| ☐ ELITE-CALC | $47.95 | $47.95 |
| ☐ ELITE-FILE | | $59.60 |

### PROGRAMMERS INSTITUTE

| | T | D |
|---|---|---|
| ▷ COMPLETE PERSONAL ACCOUNTANT — (1,2,& 3) | $59.95 | $63.95 |

### COGNITEC

| | T | D |
|---|---|---|
| ☐ TELEWRITER 64 | $39.95 | $47.95 |

### PRICKLY-PEAR SOFTWARE

| | T | D |
|---|---|---|
| ADVENTURE IN WONDERLAND | $19.95 | $23.95 |
| THE DISK MANAGER | | $23.95 |
| THE DISK MASTER | | $19.95 |
| * VIKING | $15.95 | $19.95 |
| * GANGBUSTERS | $15.95 | $19.95 |
| COLORKIT | $27.95 | $31.95 |
| SHAFT | $19.95 | $23.95 |
| JUNGLE | $15.95 | $19.95 |
| FLIGHT | $15.95 | $19.95 |

### TOM MIX

| | T | D |
|---|---|---|
| ▷ SR-71 | $23.15 | $25.55 |
| ▷ CU*BER | $22.35 | $24.75 |
| ▷ BUZZARD BAIT | $22.35 | $24.75 |
| ▷ AIR TRAFFIC CONTROLLER | $23.15 | $25.55 |
| THE FROG | $22.35 | $24.75 |
| ▷ SPACE SHUTTLE | $23.15 | $25.55 |
| ▷ THE KING | $21.55 | $23.95 |
| ▷ COLOR GOLF | $14.35 | — — — |
| TRAP FALL | $22.35 | $24.75 |
| TAPE TO DISK | $14.35 | — — — |
| DISK TO TAPE | $14.35 | — — — |

### ANTECO SOFTWARE

| | T | ROM PK |
|---|---|---|
| 8-BALL (POOL) | | $23.95 |
| PINBALL | $19.95 | $23.95 |

### DATASOFT

| | T | D |
|---|---|---|
| ZAXXON | | $31.95 |

### ADVENTURE INTERNATIONAL

| | T | D |
|---|---|---|
| * FIRE COPTER | $19.95 | — — — |
| * SAIGON: THE FINAL DAYS | $19.95 | — — — |
| * EARTHQUAKE | $19.95 | — — — |
| * AIRLINE | $19.95 | — — — |
| ▷ SEA DRAGON | $27.95 | — — — |
| ▷ TRIAD | $27.95 | — — — |
| ▷ DISKEY (Disk Access & Repair Kit and Computer Diagnostics) | | $39.95 |

### ARCADE ANIMATION

| | T | D |
|---|---|---|
| FOOD WAR | $20.75 | $22.35 |
| ICEMASTER | $19.95 | $21.55 |

### MARK DATA

| | T | D |
|---|---|---|
| GLAXXONS | $19.95 | $23.95 |
| EL BANDITO | $19.95 | $23.95 |
| COSMIC CLONES | $19.95 | $23.95 |
| HAYWIRE | $19.95 | $23.95 |

### B5 SOFTWARE

| | T | D |
|---|---|---|
| MONEY | $15.95 | — — — |
| BORROW | $15.95 | — — — |
| CARRY | $15.95 | — — — |
| MATH FACT | $13.55 | — — — |
| ABC'S | $ 7.95 | — — — |

**NOTE: ALL SALES FINAL. NO RETURNS UNLESS DEFECTIVE.** ADDITIONAL LISTINGS IN OUR FREE CATALOG — CALL OR WRITE.

*Requires 16K Ext. Basic Minimum. ▷Requires 32K Ext. Basic Minimum. ☐We Recommend 32K or 64K. Others 16K Ext. Std. Basic Minimum.

WE PAY SHIPPING TO U.S.A., CANADA, AND MEXICO. C.O.D. ADD $2.00 (U.S.A. ONLY). ALLOW 2 WEEKS FOR CHECKS TO CLEAR. NO P.O. BOXES! MUST HAVE STREET ADDRESS. SHIPPING — OTHER COUNTRIES: ADD $2.00 EACH SOFTWARE ITEM AND EACH JOYSTICK. ADD $5.00 EACH ALL OTHER ITEMS (NO MONITORS OR PRINTERS SHIPPED OUTSIDE U.S.A.). ITEMS TO BE SHIPPED AIR MAIL. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

**ENDICOTT**
**Computer Software And Accessories**
2806-A S. MEMORIAL PARKWAY
HUNTSVILLE, ALABAMA 35801
*VISIT OUR STORE*
PRICES IN AD ARE MAIL ORDER ONLY.

**PHONE ORDERS**
**205/536-4400**
(PHONE OPEN 7 DAYS A WEEK)

MasterCard **WE PAY SHIPPING!** VISA

# MC-10 Monitor Has Desirable Features

A monitor program is a utility which aids a programmer in examining and manipulating the machine code found in memory. *Micromon* is a recently released monitor for use with the MC-10 Micro Color Computer. It is designed specifically for use with the 6803 microprocessor used in the MC-10.

*Micromon* provides the features most often desired in a monitor. Memory can be examined and changed. This allows you to look at the ROM code or write machine language routines in RAM. To facilitate machine language programming, commands are included to execute machine language routines written to memory. In addition, the use of breakpoints are allowed. These stop the execution of a ML program at specified points. This is a very useful feature because you can, in effect, dynamically examine 6803 register values making it much easier to debug a machine language program.

*Micromon* is written in machine language loading with a *CLOADM* command. Once loaded, a menu is available by typing 'H' for "help." The menu includes a list of allowed functions and the single keystroke needed to evoke each function. In the memory *examine* mode, the memory contents are output to the screen in both hexadecimal and equivalent ASCII values. Eight memory values are displayed at a time. It is necessary to hit the Space Bar for each line of code. This prevents data from scrolling off the screen when examining a large block of memory. In addition to screen output, a function is provided to allow output to a printer. All addressing input to *Micromon* requires hexadecimal numbering. If you do not know this numbering system, it is learned quickly working with a machine monitor like *Micromon*.

One of the premier features of this program is built-in routines to save, verify and load to tape. Recall that the MC-10 does not have a built-in machine language save (*CSAVEM*) command. Obviously, it is impractical to attempt to write in machine language without a way to save it. These tape handling features by themselves are nearly worth the price of the software. Another significant feature of this program is its size. The size of this type of program is obviously very important to a 4K MC-10 owner. Considering the number of functions built into *Micromon*, it is surprisingly compact, taking up about 1.5K of space.

You can see I am quite enthusiastic about this piece of software. This is an excellent program for the MC-10 with very little to be critical about. The nine pages of included instructions describe the workings of *Micromon* very well. It appears for the most part to be accurate but there is at least one minor error which is in describing the use of the ENTER key to step forward in the memory change mode when actually the Space Bar should be used. *(Editor's Note: A revised, 16-page documentation is now included with this program.)*

*Micromon* is a quality utility being offered at a very reasonable price. I give this product my wholehearted endorsement, recommending this program to anyone assembling the necessary tools needed for machine language programming on the MC-10.

**(Micro Ten Software Co., 496 Amboy Ave., Perth Amboy, NJ 08861, available on tape for 4K MC-10, $13.95)**

**— Tom Szlucha**

---

*Hints . . .*

# Color Computer 2 Warning

If you are upgrading your new CoCo 2 to 64K, remember that the 16K chips you are taking out are *not* the same as the 16K chips (type 4116) that earlier CoCos used; they are type 2118, which use a different power supply (+5 volts only) and *will not* work in earlier units and could cause damage. (If you intend to do a 32K "piggyback" expansion on your CoCo 2, use another set of 2118s, *not* 4116s that came out of an older computer.)

# WANTED!

Young men and women seeking adventure, excitement and thrill-a-minute action. No experience necessary—just you and your Color Computer. See below:

**FOR THE 32K THRILLSEEKER**

| | TITLE | DISK | CASS. |
|---|---|---|---|
| NEW! | MR. DIG | $27.95 | $25.95 |
| NEW! | CANDY CO. | 29.95 | 29.95 |
| NEW! | WILLIE'S WAREHOUSE | 29.95 | 29.95 |
| NEW! | ICE HOCKEY | —— | 21.95 |
| | ZAXXON | 29.95 | —— |
| | PROTECTOR II | —— | 29.95 |
| | DESERT PATROL | —— | 21.95 |
| | ICEMASTER | —— | 21.95 |
| | FOODWAR | —— | 22.95 |
| | WACKY FOOD | —— | 19.95 |
| | CASHMAN | —— | 24.95 |
| | CHOPPER STRIKE | —— | 24.95 |
| | TIME BANDIT | —— | 24.95 |
| | **LOTS OF PLAY FOR 16K** | | |
| | MOONSHUTTLE | —— | $26.95 |
| | FROG TREK | 16.95 | 14.95 |
| | 3-D TIC-TAC-TOE | 18.95 | 16.95 |

**Interested applicants send check or m/o to:**

**OELRICH PUBLICATIONS, INC.**
**4040 N. NASHVILLE**
**CHICAGO, IL 60634**

Credit card orders call: 800-621-0105
(In Illinois call: 312-545-9286)
NO SHIPPING CHARGES!!!

# J-CAT Modem
# A Low-Cost, Auto-Answer Solution

It seems like everyone with a home or business computer wants to get connected to the information services, bulletin boards and other systems that can be reached by a phone call. If you want your computer to take calls from other users, the only practical way is to use what's known as an "auto-answer" modem. Until recently, they were revoltingly expensive, but Novation has broken the price barrier with its J-CAT, which provides full auto-answering for under $130.

The J-CAT is an extremely small (5" x 2" x $1^1/_3$") device, and Novation recommends that you stick it on the side of your telephone using the quick-release Velcro strip on the bottom of the modem. (Do this only if you're sure that the modem will always be used with that phone; when I tried to take the strip off my phone, some bits of adhesive stayed on and I haven't gotten them off the phone yet!) It comes with an AC adapter, a line cord that replaces the one on your phone (if yours doesn't unplug from the phone, you can use an adapter that is also provided to connect the two) and a serial I/O cable. This is normally provided with a 25-pin plug to fit most computers (and will work with the Deluxe RS-232 Program Pak), but Spectrum Projects ships the J-CAT with a 4-pin plug for the CoCo and MC-10.

The J-CAT modem is as easy to use as any I've seen. After you call the other computer, you press the CONNECT button and the J-CAT "picks up" and waits for the other system's carrier tone; when it comes on, the J-CAT sends its own tone and the connection is made. An OFF HOOK light indicates that the modem is on the line, and a READY light glows when the connection is established. To take the J-CAT off the line, you tap the DISC/TEST button quickly. If you hold down the DISC/TEST button for a moment, the modem will go into a test mode (READY light will be on, but the modem will not be on the line) that feeds each character from the computer through the modem's circuitry and back into the computer; if the characters you type appear on the screen, the modem and computer are working properly.

This is all well and good, but other modems will do this at a lower price. The J-CAT's biggest attraction for CoCo users is the auto-answer capability. If you leave the J-CAT plugged into the phone line, when a call comes in it will pick up automatically and send a carrier tone. The most popular application of this is with bulletin board systems; I tried the J-CAT with Ceratec's *Colorama BBS* program to test this feature. (Another interesting auto-answer application is one that THE RAINBOW's sister publication, SCORE**CARD**, used to cover University of Louisville basketball games; a SCORE**CARD** reporter took a TRS-80 Model 100 portable computer to road games and transmitted his stories to a CoCo at the office. We simply used a terminal program to hold the text in its buffer until it could be saved to disk later.)

The J-CAT works well with the CoCo in both originate and auto-answer modes. I tried it with five different terminal programs as well as the *Colorama BBS*. Since Spectrum Projects sells the J-CAT mainly for use with *Colorama*, the cable is wired to match the unusual connection scheme it uses. This modified cable still works with various terminal programs, but with Eigen Systems' *Colorcom/E, Version 2* you have to press the BREAK key twice to force the program into communication mode.

One nice feature of the J-CAT unfortunately can't be used by the CoCo easily. The J-CAT is capable of automatically dialing the desired telephone number. Unlike the Hayes Smartmodem or Radio Shack's Modem II, which let you type the number in from the keyboard, the J-CAT has an extra input line that lets the computer send dial pulses over the phone line. The CoCo, however, doesn't have any extra RS-232 output lines to send such a signal to the modem. Using the auto-dial feature will involve some rather complex hardware hacking.

The Novation J-CAT is an inexpensive way to get auto answering for a bulletin board or what have you, and it works well for ordinary modem uses too. If you actually need auto-answer, the J-CAT is hard to beat.

**(Spectrum Projects, 93-15 86th Dr., Woodhaven, NY 11421, $129.95 plus $3 S/H)**

**— Ed Ellers**

COMPUSETTE.

NEVER UNDERSOLD

AGFA
PE 611

"We'll Meet or Beat ANY Comparible Offers!!"

| Diskettes | Qty. | Retail | Sale |
|---|---|---|---|
| 40-Track | 10 pak | $\$3^{99}$ | $\$1^{99}$ ea. |
| Single Sided | 20 pak | $\$3^{69}$ | $\$1^{89}$ ea. |
| Double Density | 50 pak | $\$2^{99}$ | $\$1^{79}$ ea. |
| With Hub Rings | 100 pak | $\$2^{49}$ | $\$1^{69}$ ea. |
| | 10 pak case | $\$4^{99}$ | $\$3^{50}$ ea. |

| Cassettes | 12-Pak | 24-Pak | 250-Case* | 500-Case* |
|---|---|---|---|---|
| C-5 | 65¢ | 55¢ | 41¢ | 36¢ |
| C-10 | 69¢ | 59¢ | 49¢ | 39¢ |
| C-15 | 79¢ | 69¢ | 59¢ | 49¢ |
| C-20 | 89¢ | 79¢ | 69¢ | 59¢ |
| Hard Box | 26¢ | 21¢ | 16¢ | 13¢ |

* 250/500 Bulk Quantities, Labels 4¢ Extra

UPS Shipping (48 States) $\$3^{00}$ Per Pak, $\$18^{00}$ Per Case

Micro-80™ INC.

2665 Busby Rural Road
Oak Harbor, Wash., 98277

VISA MasterCard

IMMEDIATE SHIPMENT

1-(206)-675-6143

RAINBOW CERTIFICATION SEAL

PAL

PAL CREATIONS

Specializing in 32K ECB Text Adventures
And Simulations On Cassette

★SAC For those against nuclear disarmament – pilot a B52 to any one of the 36 Soviet cities, destroy it with a nuclear bomb, and make it back to the base. 9 difficulty levels. You can use keyboard or joystick or both. This simulation takes a lot of pre-planning and fast thinking. . . . . $19.95

★ HERE COME DE PREZ Are you fed up with the State of the Union? If so, run for president in this 1 or 2 player simulation complete with scandals, national disasters, and debates . . . $14.95

★ PRIVATE INVESTIGATOR Murder! Could Sherlock Holmes have solved this whodunit adventure simulation? . . . . . . . $14.95

ISLE OF FORTUNE You are a fisherman in a waterfront bar. The old salt just told you a tale of treasure on an island, before the poison dart struck . . . . .Sail your ship to dangerous adventure awaiting you on the Isle of Fortune . . . . $19.95

SCAVANGE HUNT Find the items on the list and return them to Hickory Ridge to free your niece Rebecca from the hermit of Medicine Tree County. . . . . $15.95

★ BOMB SCARE A terrorist group has planted 8 bombs in a city. Your mission: locate and disarm all 8 before time runs out. 1 is The Big One. . . . . $14.95

★ DARK CASTLE Monsters-magic-myths. King Lothar of Rom has been abducted by the evil wizard. Destroy the wizard and return Lothar to his throne . . . . $14.95

MANSION OF DOOM Destroy the Vampire, rescue Princess Marlena. . . . . $14.95

★ WITCHES KNIGHT Back to the days of old, where knights were bold and magic ruled the land. Many enchanted surprises await you on your quest to free Sir Noble from the witches evil spell. . . . . $15.95

BEACON Can you signal the ship before it runs aground? . $14.95

★ SPACE ESCAPE Explore a death-ridden alien spacecraft in search of a way back to Earth . . . . $14.95

STALAG Escape the German prison camp before its bombed . . . . $14.95

★ EVASION Sequel to STALAG! Get out of Germany alive. . . . . $19.95

★ FUNHOUSE Work your way through this unique Funhouse searching for the way out . . . . $14.95

★ SCATTERBRAIN Help wanted: Put Commodore Winslow's 85-room mansion in order in this graphic adventure . . . . . $14.95

Buy any 1 of the programs above and get any of the bonus programs below FREE!

★SKI LODGE Times are tough, weather is bad. Manage a Vermont ski lodge successfully to win this 1-4 player simulation.

MOTHER LODE You just inherited your great-grandfather's goldmine. Did he die penniless?

ENO You inherited a million dollars. Just one catch – first you have to find it!

BETTER A better betting game for 1-4 players. You choose the winning criteria.

MATCH–IT A challenging word game in which you identify your opponent's 5-letter word using deduction. 1-4 players.

★DIFFERENT EVERY TIME

Send check or money order to:

PAL CREATIONS
10456 Amantha Ave., San Diego, CA 92126

Calif. residents add 6% sales tax.

# Create A Better Looking Listing With *Pretty Printer*

If you do much programming with the Color Computer, I'm sure you have noticed that frequently good programming procedures create conflicting requirements. There are measurable advantages in terms of space savings by using multiple statement command lines in a program, but this code compacting practice limits the ability to read and make sense out of a program. Of course, you know that readability is a key to debugging a complex program.

By using the utility called *Pretty Printer* you can "have your cake and eat it too." With this program the Color Computer will automatically create listings formatted in an easy-to-read fashion. The program breaks up multiple command lines onto separate lines as well as indenting three spaces for each loop encountered. It is easily shown with an example.

**Before:**

```
10 PRINT"THIS IS A TEST": FOR X=0 TO 255:FOR
Y=0 TO 192: C=PPOINT(X,Y):IF C=4 THEN PRINT
"RED ENCOUNTERED":NEXT Y:NEXT X:END
```

**After:**

```
10 PRINT "THIS IS A TEST"
  FOR X=0 TO 255:
    FOR Y=0 TO 191:
      C=PPOINT(X,Y):
        IF C=4 THEN PRINT"RED ENCOUNTERED":
    NEXT Y:
  NEXT X:
END
```

As you can see with this simple "before" and "after" *Pretty Printer* listing, this program could be beneficial if you write in compact code. It makes the listing much easier to read.

*Pretty Printer* loads as a BASIC program with the machine language routine appended at the end. It automatically loads and according to the distributor, the ML utility adjusts itself for the size of machine in which it is used. I used it with a 32K disk system and it worked flawlessly. Once loaded you are not aware of its presence until you *LIST* or *LLIST* a program. It does its work efficiently, visibly slowing down the listing. The only possible problem that I know of is that the current version is not compatible with the 1.2 BASIC ROM used in the Color Computer 2, but by the time you read this a newer version should be available. State your ROM level when ordering.

If you write in compact code or have the need to decipher someone else's code, *Pretty Printer* is an affordable routine which works very effectively in making the listings readable.

**(DATAMAN, P.O. Box 431 Sta. B, Hamilton, Ontario, Canada L8L 7W2, 4K minimum, tape $12.95 Canadian)**

**— Tom Szlucha**

# *Pie Chart*
## Sliced A Bit Thin

*Pie Chart* is really a one function utility designed for cassette tape users. (Disk system needs may mix up graphics screens and, as written, forget the disk.) The single function is the creation of pie charts. The charts produced are mostly black and white. Some color shows up in the labels, but the slices of the pie are either black or white. The user has no control over which sectors are black or white. The program just alternates the "color" as the sectors are printed to screen.

The bells and whistles are included in the information screens which display the user's entered data. Each screen comes up in a different combination of colors (random order). Before the user can get to these colorful screens the data must be entered either as whole number "values" or "percentages" for each of the user-selected titles for the sections. These titles cannot be more than five characters in length as the program will only print five characters to the screen. For each of the titles, a value is entered and the program will handle a total of 20 entries. The entries in percentages must not equal more than 100 percent or *Pie Chart* will crash.

The pie chart will be produced with each section proportional to the value of the data for that section as it relates to the total. After the pie is on screen, the user can hit ENTER and all the entered data is displayed; hit the ENTER again and new screen shows the titles and their percentage of the total.

The user may correct data (sometimes) or titles after a pie chart is displayed or the "data" or "picture" may be saved to tape. The data is saved in standard form; however, "pictures" are saved in a machine language format. The program author suggests that saves of "data" be on one tape and "pictures" on another to avoid the FM Errors. There appears to be a little quirk in the program in that if the user tries to decrease the value of a percentage already entered, an FC Error occurs, the program aborts, and all information is lost. Needless to say, when the program author notes that you cannot enter more than 100 percent for percentages, he is correct; to do so will cause the program to crash.

The instruction sheet with the program is only a couple of paragraphs; but all the needed instructions are part of the program. The first time through, load in the instructions and page through several screens of clear, straightforward, instructions. For most users, only one run through the instructions will be enough since the program has many prompts which lead the user through the steps.

A part of the program loads data or pictures from tape. For special effects, the loading section of the program which handles pictures has been set aside as a separate chart-load program (with its own instructions). To use this part of the package, the user must have on tape the pictures (or screens) to be loaded. The pictures are then loaded with *AUDIO ON*, and begin to write across the screen in sequence. It takes about 30 seconds to load each picture. The effect can be useful to show a series progression (sales report one month at a time, for example).

The most dastardly thing *Pie Chart's* author did was to include in the sample of pictures three Hi-Res pictures (two in three colors). The program cannot produce such images but it can handle them if you are able to create them with another program.

*Pie Chart* is a program for viewing only. There is no hardcopy option; but a hacker might append such a driver to get a hard-copy of the screen.

If there were not a Radio Shack *Graphics* (or *Disk Graphics* and some other similar programs on the market), *Pie Chart* would be useful in many instances. However, it is only a single function program, and *Graphics* and some of the others do so much more! A Pie to Pie comparison between *Pie Chart* and, for example, *Graphics*, would leave *Pie Chart* looking a little like it needed more filling. As an onlooker noted when asked if he wanted the pizza pie he ordered cut into four or eight pieces: "You'd better cut it into four pieces, cause I don't think I could eat eight pieces." So with *Pie Chart*, for some it will fill their needs; but others, no matter how you slice it, will want a little more.

**(Harmonycs, P.O. Box 1573, Salt Lake City, UT 84110, tape $10.95)**

**— Robert E. Foiles**

CMJ-IF
MULTI-FUNCTION
PLUG-IN CARTRIDGE
FOR
TRS 80C & TDP 100
COMPUTERS
PROVIDES

* * *

AN EXTENDER
2 PARALLEL PORTS
2 COUNTER/TIMERS
1 SERIAL COMM. LINE
SPEECH SYNTHESIS
4 OR 8K EPROM/ROM SPACE
*SPEECH FROM TEXT, BASIC, RTTY*
INTERFACE FOR *CMJ-TU
*(CW,RTTY,SSTV,FAX)

MAGNUM DISTRIBUTORS INC.
1000 S. DIXIE HWY. W. #3
POMPANO BEACH, FLORIDA 33060
TLX. 514365 305-785-2002

# *Keep Text II* — A High Quality Word Processor

When looking for a word processor, several factors should be kept in mind. It should be powerful enough to handle text formatting chores like pagination, headers and footnotes; flexible enough to fully utilize any available printer and its graphics capabilities; and, most importantly, it must be simple to use. *Keep Text II*, from P&M Software Company, meets all these criteria.

*Keep Text II* is a simple, yet powerful, word processor that will adapt itself to run on any CoCo with at least 16K, taking advantage of up to a full 64K bytes. Both disk and tape files are supported at the same time (Extended BASIC 1.1 is required if the disk is used). Before using the word processor for the first time, the user follows a clearly documented procedure to customize the software to the particular printer being used. Control codes for your printer's underscore and carriage return functions are *POKEd* into store, then copied out with the word processor software via *SAVEM* or *CSAVEM*. Once the customization is done, *Keep Text II* is simply loaded and *EXECuted*.

Upon starting up the program, you are greeted with a master menu which provides options for loading and saving disk or tape files, sending files to the printer and other useful options. Once a file is in store (or Start New File is specified) the editing session begins. One of the nicest features of *Keep Text II* is that at any time, the user may ask for help by entering the 'T' (for Teach) command which will display a summary of all the available commands on the screen.

*Keep Text II* runs in one of two modes, Command mode or Edit mode. Command mode is signified by a solid blinking orange cursor and allows a wide variety of commands to be entered. These commands include page scrolling, line or character insertion and deletion, string search, change string and a cut and paste facility for copying or moving text within the document. I found the cut and paste command to be particularly useful and easy to use. Up to 1,024 characters may be "cut out" of the document and "pasted" back into one or more places in the document.

Edit mode, which shows a transparent green cursor, provides a full-screen editor for entry and direct modification of text. Corrections are made in Edit mode by simply positioning the cursor over the character or characters to be changed and retyping them. In addition to raw text, a variety of commands known as Paragraph Commands may be entered into the document. These commands, which typically begin with '@' and appear alone on a line, provide control directives to the word processor. Paragraph commands allow you to specify page format information such as single or double line spacing, page length and width, top, bottom and side margins and header and footer details. You can also control page numbering, word underlining and overstriking, and cause *Keep Text II* to pause between printed pages so that the paper in the printer can be changed. There is even a paragraph command that allows you to send any special printer control codes to your printer.

I was impressed by *Keep Text II's* high quality. I found it easy to learn and to use primarily because of the teach screens and, since it is coded in machine code, it performs well. Aside from the CoCo's annoying display of lowercase letters, the only inconvenience in using *Keep Text II* is that inserting text into a document is a two-step procedure; space must be made first by using an insert character command, then typing the new text in. However, *Keep Text II's* power, flexibility and simplicity make it a very attractive entry in the CoCo word processor market.

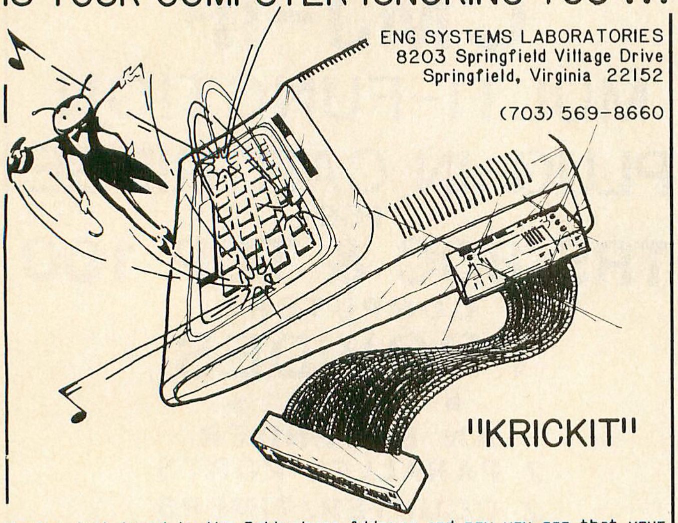
**(P&M Software Company, 11600 S.W. Freeway, Suite B-364, Houston, TX 77031, tape $29.95)**

**— Gary E. Epple**

IS YOUR COMPUTER IGNORING YOU ???

ENG SYSTEMS LABORATORIES
8203 Springfield Village Drive
Springfield, Virginia 22152

(703) 569-8660



You've just typed in the Gettysburg Address and now you see that your computer only heard every other word!

THE KRICKIT CHIRPS ONLY WHEN YOUR COMPUTER HAS CAUGHT THE KEY. With the Krickit, there is no wasted effort pounding keys to make sure they contact or looking at the screen after every character. You can keep your eyes on the listing and not lose your place.

Works great with text editors and DBM's (Telewriter-64 and Homebase, to name a few) or when entering programs with just the BASIC line-editor in your computer. Just plugs in! Needs no software or hardware modifications. Built-in speaker! Uses no CPU time! Your computer has better things to do than sound key beeps.

The Krickit has other valuable features, too. A convenient switch controls the Cartridge Interrupt line. Instead of clumsy, messy tape on fingers 7 or 8, just flip the switch to access Basic with a game pak installed. It also has a more accessible reset switch, lighted power indicators, gold edge-fingers and an extension cable.

We are sure that after you try the Krickit you will never want to be without it. Take 30 days to decide you like it or return it for a full refund. 24-hour order line. Order yours today for only $59.95 (plus shipping and handling). COD, Visa, and Mastercard accepted.

FLIGHT SIMULATOR

Very Exciting & Challenging. Practice Takeoffs, Landings, Turns, and Navigation. Fully Instrumented. Extended Basic Not Required. Minimum System 16K.

CASSETTE ONLY $15.00
Add $2.00 Shipping and Handling
Majestic Software
P.O. Box 91
Westland, Michigan 48185

RAINBOW CERTIFICATION SEAL

***Hardware Review***

# Gemini-10X Printer First-Rate Features, Low Price

**By Ed Ellers**

From the day it hit the scene in 1980, the Epson MX-80 printer was a runaway hit with TRS-80 users. Its many printing features, good print quality and low price made it very attractve. The MX-80 was soon joined by the MX-80 F/T (which accepted single sheets) and the wide-carriage MX-100. In 1982, a company called Star Micronics came out with the Gemini-10, which was very much like the Epson printers and shared many of their printing modes. Star later went back to the drawing board and reprogrammed the Gemini to very closely emulate the Epson MX printers in almost every way. Many people have called the Gemini-10X a clone of the Epson MX, FX and RX series printers. It isn't. But, as we shall see, the Gemini-10X stacks up very well against the mid-priced printers like Epson, while its price is down there among the low-cost printers like the Gorilla Banana and Radio Shack's new DMP-110.

At first glance, the Gemini looks very much like an Epson FX-80 F/T. The switches, sockets, buttons and lights are in almost the same places. A removable tractor-feed assembly sits directly over the platen. Like the FX-80 F/T, the Gemini-10 can use tractor-feed paper (including multi-part forms and self-adhesive labels) and single sheets; the Gemini can also use 8½-inch roll paper (a roll holder is included).

The most noticeable difference between the Epson and Gemini is in the ribbon. Epson uses a ribbon cartridge that spans the width of the platen. The Gemini-10X uses, interestingly enough, a standard typewriter ribbon! This ribbon is specified in the manual as a Fuji Kagakushi Kogyo SF-02B, but a local business machines dealer tells me that the ribbon is the same as that used by Brother and Underwood manual portables. If you do buy a typewriter ribbon for the Gemini, be sure that you get a high-quality product, as a cheap ribbon can easily gum up the print head (Spectrum sells Gemini replacement ribbons for $4.99). The ribbon is fairly easy to install, certainly no worse than the portable typewriters I'm familiar with and only a bit less convenient than on printers with cartridge ribbons. Since this ribbon's width is twice the height of the printed line (to make room for the red ink or correcting side on a typewriter), when one side of the ribbon wears out you can turn the spools over and use the other half.

To get the printer working with the CoCo, you will need some sort of parallel interface adapter to connect the CoCo's serial output to the Gemini's parallel input. Spectrum Projects sells the PBH CoCo Serial Interface, which normally lists for $89.95, for $50 when purchased with the Gemini-10X. The PBH interface operates at a variety of speeds ranging up to 9600 Baud, which is just about as fast as those computers with parallel printer outputs. The PBH also has a switch to select the printer or another RS-232 device, such as a modem. (The PBH is reviewed by Jim Reed elsewhere in this issue.)

Setting up the printer also involves setting the DIP switch on the back of the printer (you don't need to open the case) to match the way that the CoCo expects a printer to behave. Switch 4 should be set to "on" to insert a line feed after each carriage return sent by the computer. The other three switches are set to the correct positions for fan-fold paper at the factory, but if you use single sheets you will need to set switch 1 to "off" to disable the paper-out sensor. There are eight more switches inside the printer, but for normal use you can leave these alone unless you need a foreign character set. (If you use emphasized printing a lot, you can set switch 2 on the inside block to "off" to make it the default mode.)

This leads me to another point. The Japanese knack for combining electronics and precision mechanisms is the reason for their dominance of the dot-matrix printer market, not to mention video recorders and plain-paper copiers. Somehow, Japanese companies (with the notable exception of Panasonic) haven't shown the same skill at writing manuals in plain English to tell how to make the printers work. The booklet that comes with the Gemini-10X when it's shipped from Japan is no exception; it seems to have been written for a Japanese engineer and then translated into English by someone unfamiliar with the technical terms involved.

Shortly after Epson introduced the MX-80, it realized the need for a really good manual and had David Lien (who wrote the Level I Users' Manual for the Model I way back in 1977) write a new manual for them. Star Micronics took this as its cue and had a new manual written by Valleyware Publishing. This book (which is sent to the dealer separately, but is furnished at no charge with the printer) has 10 chapters filled with useful lessons on making the Gemini do its various tricks and 15 appendices with the code tables, specifications and other goodies. Appendix F deals with the TRS-80; it's geared towards the Model I/III/4/4P and II/12/16 series computers, but everything applies equally well to the CoCo. Fifteen demonstration programs are included in the book; all but one will work fine on the CoCo

USE YOUR PRINTER

SHAMROCK SOFTWARE can help you do that. Worksheet makers are available for many different topics. Each worksheet would be different. Topics include : WHOLE NUMBERS, FRACTIONS, DECIMALS, PERCENTS, LENGTH, WEIGHT, AREA, VOLUME, CAPACITY LIQUID AND DRY, TIME, and SPEED. Try our word search puzzle makers, STANDARD, WIDE, BOLD, and especially DEFINTION. Each tape only $9.95 .

Shamrock Software 4382 Norton Road Radnor, Ohio 43066
614-494-2277 Ohio residents please include 5.5% tax

OWLS NEST SOFTWARE
' WE GIVE A HOOT '

NEW!!! FILE CABINET - Data Management System
With FILE CABINET you can create and maintain records on anything you choose. Recipes, coupons, household inventory, financial records - you name it. You create records containing up to five fields you define. You can search, sort, modify, delete, save on tape and display on the screen or send to the printer. The program is user friendly and user proof. Error trapping and prompting are extensive. A comparable program would cost you much more. Cassette 16K EXT - Postpaid $19.95

LABELIII (Reviewed in Nov. 83 Rainbow)
With LABELIII you can develop and maintain a mailing list. Display on screen or printer. Print lists or labels in your choice of 1, 2, or 3 wide. Supports 3 or 4 line addresses with phone optional. Fast machine language sort on last name, first name, or zip code.
Cassette 16K EXT - Postpaid $19.95

ATLANTIS ADVENTURE
This one is tough! We challenge you to complete this in 30 days. If you can we will send you any cassette program we sell at no charge. (We will even pay the postage.) You start on a disabled sub, near the lost city of Atlantis. Your object is to get the sub and yourself safely to the surface.
Cassette 16K EXT - Postpaid $21.95

ADVENTURE STARTER (Reviewed in Feb. 84 Rainbow)
Learn to play those adventures the painless way. You start with a simple adventure and then move into an intermediate. We also include hints and tips on adventuring. Your 16K EXT cassette includes both "MYHOUSE" and "PIRATES" adventures. Finish this and you are ready for "ATLANTIS."
Cassette 16K EXT - Postpaid $17.95

FOUR MILE ISLAND ADVENTURE
You are trapped inside a disabled nuclear Power Plant. The reactor is running away. You must bring the reactor to a cold shutdown and prevent the "China Syndrome." Can you save the plant (and yourself)? It's not easy!
Cassette 16K EXT - Postpaid $17.95

ESPIONAGE ISLAND ADVENTURE
You have been dropped off on a deserted island by a submarine. You must recover a top secret microfilm and signal the sub to pick you up. Problems abound in this 32K text adventure.
Cassette 32K EXT - Postpaid $17.95

PROGRAM FILE (Reviewed in Oct. 83 Rainbow)
Organize your cassette programs. Let your computer find that program for you. Create and maintain a four field file. You can search, sort, modify, delete and display on screen or printer. Sorting may be done by name, type or location.
Cassette 16K EXT - Postpaid $14.95

NEW!!! GRENADA INVASION
As an 82nd airborne trooper you must get to Grenada, rescue Americans, local citizens and recover enemy arms. You will have to deal with hostile enemy troops and avoid many pitfalls to accomplish your mission.
Cassette 16K EXT - Postpaid $14.95

NEW!!! KINGDOM OF BASHAN
Our most involved adventure to date. Bashan has a large vocabulary and some unique problems to solve. You must enter Bashan (not easy) collect the ten treasures of the kingdom while staying alive (even harder) and then return to the starting point with the treasures (even harder). If you can get the maximum 200 points in this you are an expert!
Cassette 32K EXT - Postpaid $17.95

*C.O.D. orders please add $1.50
*No delay for personal checks

IN A HURRY? CALL OUR HOOT LINE: (615) 238-9458

VISA® OWLS NEST SOFTWARE MasterCard
P.O. BOX 579, OOLTEWAH, TN 37363

if you type in *PRINT#-2* instead of *LPRINT*.

The manual starts off simply, telling a little about how the printer works and how to put in paper, change the ribbon and hook up the printer to your computer, then starts right in with some sample programs. (The listings in the text are for MBASIC for the IBM Personal Computer, but TRS-80 versions are in the appendix.) The first program shows off the various text modes; it's followed by demonstrations of graphics and customized characters. Chapter 9 explains all of the different printing modes in detail.

And there are a lot of them! Here's a partial list:

- Italics
- Eight international character sets
- Pica (10 characters/inch) and elite (12 chars./in.)
- Condensed printing (136 columns, 17 chars./in.)
- Emphasized printing
- Double-strike printing
- Underlining
- Subscript and superscript
- Bit-image graphics (480-, 960- or 1920-dot columns)
- User-defined custom characters

In most cases, various printing modes can be combined for a desired effect. One example is the technique we use for formatting RAINBOW BASIC program listings. This is actually done on an Epson MX-80 F/T, but the Gemini does it the same way.

```
PRINT #-2, CHR$(27) "E"; CHR$(27) "G"; CHR$(27)
"Q" CHR$(32)
```

This statement sets up both emphasized and double-strike modes for very dense printing, and also sets a line length of 32 columns instead of the normal 80. This causes the listing to match what you see on your screen.

The codes used to access the various features are, in nearly all cases, the same as those used by an Epson MX (with Graftrax Plus), FX or RX printer. (There are minor differences between the three models of the Epson series; as far as I've been able to determine, all the codes they have in common are shared by the Gemini-10X.) The four Epson font controls provided by *Telewriter-64* work fine, as does the pseudo-underlining feature.

The Gemini-10X print quality in all modes is excellent. The normal characters in pica mode are a bit light (as they are on Epson); this conserves ribbons when the printer is used in non-critical applications. All other fonts are normal, and emphasized printing can be used to make pica type look good. One thing that some hackers won't like is that the zero doesn't have a slash; however, the shapes of the zero and capital O leave no question as to which is which, and non-slashed zeroes look better in many cases.

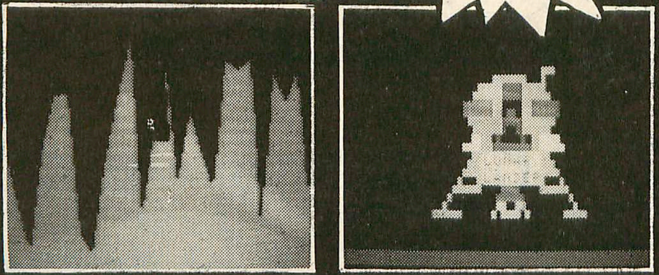
The printer is quite fast, too; rated speed is 120 characters per second for normal pica type. Printing is bidirectional (to save the time needed to return to the beginning after each line), and logic seeking is also used to save time. The unit is quite sturdy, and is said to be capable of continuous duty (although I didn't run it for hours on end). The print head is rated for 100 million characters average life, and is quite easy to replace.

The Star Micronics Gemini-10X has first-rate print quality, many features and a price that's very hard to beat. It is the best printer for typical CoCo uses that I've ever seen.

**(Spectrum Projects, 93-15 86th Drive, Woodhaven, NY 11421; printer $299.95 plus $3 S/H, with PBH interface $349.95 plus $3 S/H)**

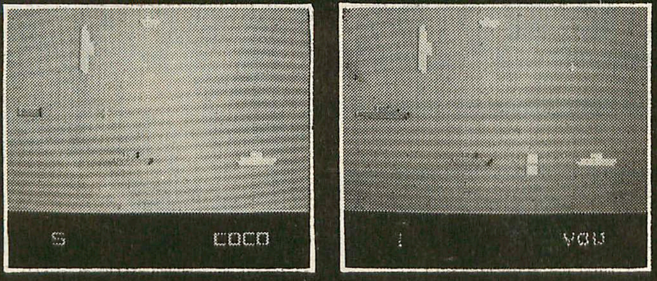
# SHELL *software*

ML AUTHORS TOP ROYALTIES PAID



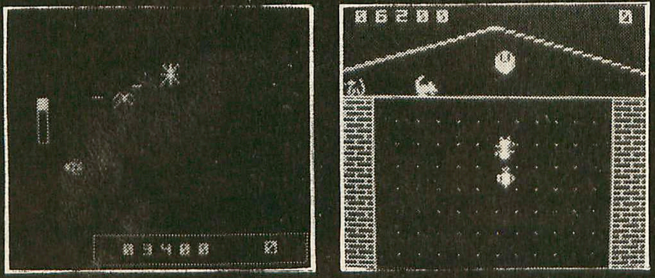
LUNAR LANDER 16K EXT - It's up to you commander, your space craft is damaged and your losing oxygen. You must land to repair. You have a choice of 4 different planets to land on.

32K LUNAR LANDER works with SPECTRUM PROJECT'S Voice Pak. $15.95



SONAR SEARCH 16K EXT - OK, Captain you have a fleet of enemy ships to find and destroy. Your battleship is equipped with depth charges and sonar. TWO PLAYER GAME.

32K SONAR SEARCH - You must defend your fleet from the relentless strategy of the computer controlled fleet. (JOYSTICK) $18.95



EXTERMINATOR 16K EXT - You've had it, BUGS are everywhere and its time to fight back. With a can of "RAID" in hand and a JOYSTICK in the other, you begin fighting the marching insects. 32K

EXTERMINATOR - Now there are two action packed screens of fun. $18.95

STAR RAID 16K EXT - Dock with one of two base station to fuel up and fight the attacking aliens.
32K STAR RAID - Now you can land on earth and fuel up, but its not that simple. (JOYSTICK) $18.95

SNOOPY & THE RED BARRON 16K EXT - A hi-res graphic "DOG" fight for TWO players. See review in January's issue of RAINBOW.
32K SNOOPY & THE RED BARRON - A totally advanced version with unlimited options. (JOYSTICK) $18.95

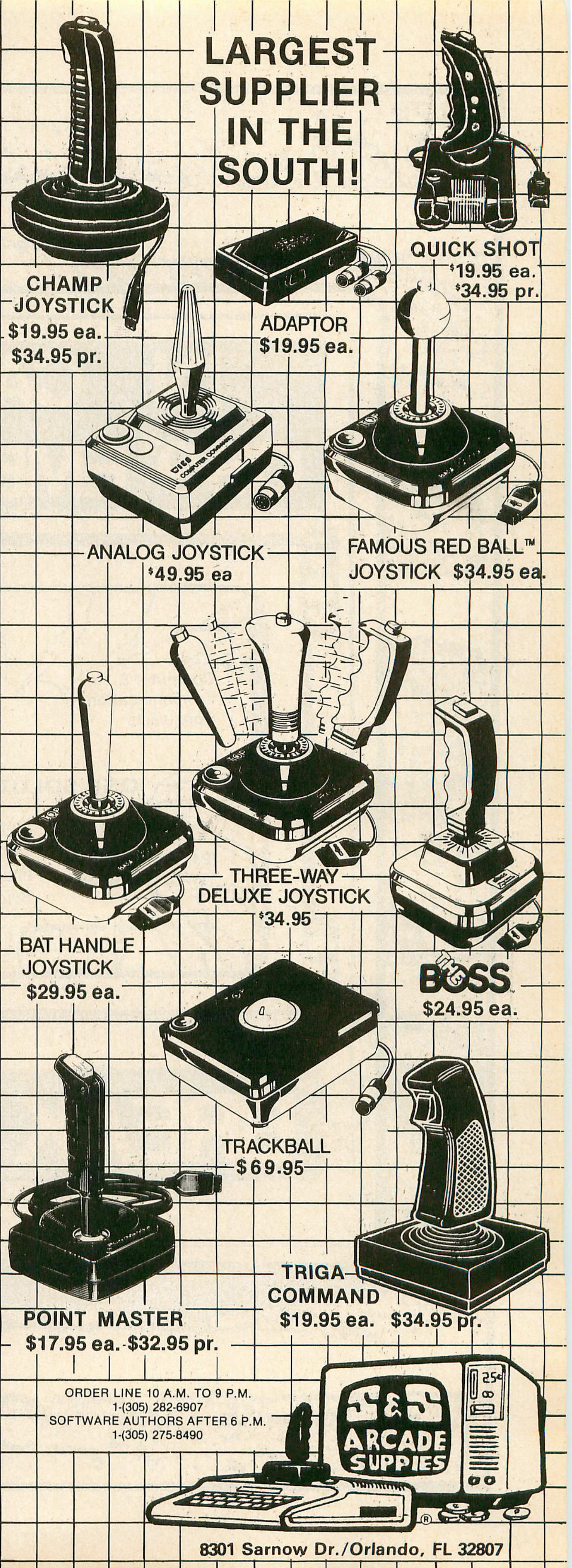
FEDERATION BOOT CAMP 16K EXT - You've been drafted for 16 weeks. Four complete tasks, which after completed you advance to the next screen. Can you hack it? (JOYSTICK) $18.95

DEATH STAR 32K EXT - You are pitted against the EMPIRE, using your gut feelings and the force you can save the princess. Battle guards, buy weapons, and armor. $19.95

- **ALL SHELL 16K GAMES HAVE 32K VERSIONS INCLUDED**
- **FREE 16K ADVENTURE WITH $50.00 ORDER.**
- **YES! SHELL GAMES ARE AVAILABLE ON DISK, ADD $2.50.**

M/L AUTHORS, TOP ROYALTIES PAID!

USA Orders under $50 - Add $2.50
OTHER Orders Add $5.00 ship/hnd.
Fla. Residents add 5% sales tax.
Visa/MC Add 5%
NO C.O.D. ORDERS



## LARGEST SUPPLIER IN THE SOUTH!

CHAMP JOYSTICK
$19.95 ea.
$34.95 pr.

ADAPTOR
$19.95 ea.

QUICK SHOT
$19.95 ea.
$34.95 pr.

ANALOG JOYSTICK
$49.95 ea

FAMOUS RED BALL™ JOYSTICK $34.95 ea.

BAT HANDLE JOYSTICK
$29.95 ea.

THREE-WAY DELUXE JOYSTICK
$34.95

THE BOSS™
$24.95 ea.

TRACKBALL
$69.95

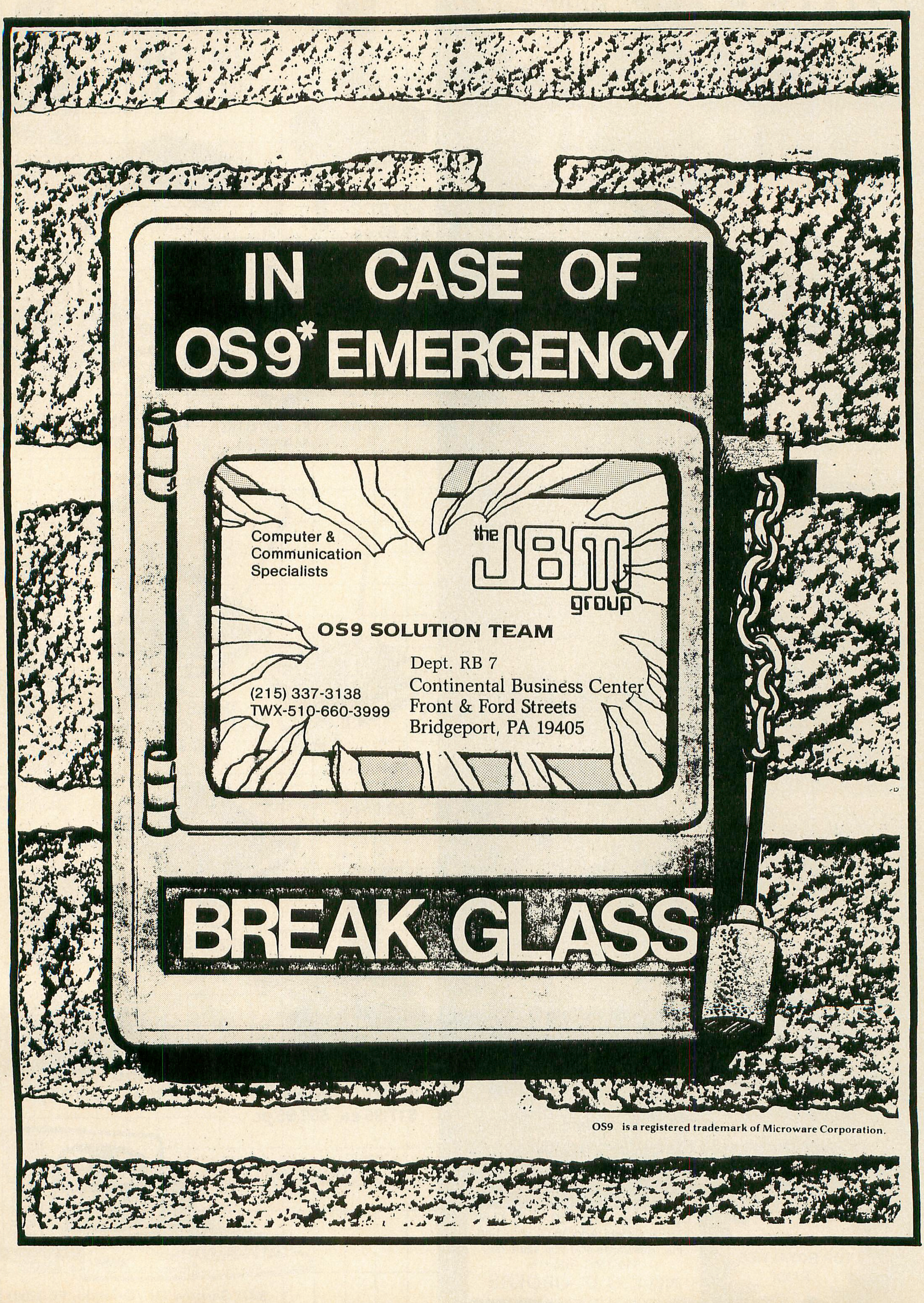
POINT MASTER
$17.95 ea.-$32.95 pr.

TRIGA COMMAND
$19.95 ea. $34.95 pr.

ORDER LINE 10 A.M. TO 9 P.M.
1-(305) 282-6907
SOFTWARE AUTHORS AFTER 6 P.M.
1-(305) 275-8490

S&S ARCADE SUPPIES®

8301 Sarnow Dr./Orlando, FL 32807


IN CASE OF
OS9* EMERGENCY
BREAK GLASS

Computer &
Communication
Specialists

**the JBM group**

**OS9 SOLUTION TEAM**

(215) 337-3138
TWX-510-660-3999

Dept. RB 7
Continental Business Center
Front & Ford Streets
Bridgeport, PA 19405

OS9 is a registered trademark of Microware Corporation.

# Along Comes Tape Tamer — *T.UTIL*

*T.UTIL* is a machine language utility program that allows a tape user to manage a tape system in much the same manner as the disk "zapper" programs help in the management of a disk system. In short, it allows you to tame your tape system. When most of us start in microcomputing, we choose the tape system because of the cost of a disk system. So, we begin to accumulate programs: from vendors, magazines, bulletin board systems, commercial subscription services, and some that we write ourselves. Before I saved enough to get a disk, I had accumulated over 120 individual tapes (I still add to this collection). Pretty soon it is difficult to remember which files are on which tapes, and we have all been repeatedly frustrated by all of the work required to copy files from tape to tape. But we still can't afford the disk system, so we suffer along. Well, take heart! *T.UTIL* will help.

Upon loading, *T.UTIL* greets you with a neat low resolution graphic title screen followed by the copyright notice, and then initializes the maximum memory of your system (up to 32K). You then see the "?" prompt that is used instead of the blinking cursor. At this point, you can execute nine different utility commands (these may be entered with just the first letter of the command, or they may be spelled out):

1) READ — loads a file from tape into memory. You may specify a filename and the tape will be searched until the named file is found, otherwise it will just read in the next file on the tape. This process may be used to read in as many files as available memory will allow. Only the last file, however, will be "visible" to the program.

2) APPEND — allows you to link files together. The files, however, must have been saved in ASCII (*CSAVE"FILENAME", A*) and the line numbers of each file must not be in conflict, otherwise the succeeding file will overwrite the previous file. So you must edit the files before attempting to use the APPEND command. You may append up to four files to any file that has been read into the buffer.

3) DELETE — clears the tape buffer. Since this is a destructive command, it would be helpful to have a prompt to be sure the deletion is really desired. It is possible that a (D) may be entered by mistake.

4) WRITE — writes the contents of the tape buffer out to tape. You may change the name of the file to be written by placing the new name after the command. You may also designate new start and load addresses for machine language programs (this must be done in Hex, however). The file that was written remains in the buffer for verification (see below) or any other operation desired.

5) VERIFY — is used to determine that a tape file is readable. You may also use this command to find a file on the tape. This command should be used after a file has been written to tape. Note the tape counter before you write the file, or if your tape recorder doesn't have a counter, remember the name of the last file before you write yours out to tape. After writing, rewind the tape several feet and VERIFY LASTFILE (this would be the name of that last file). This will stop the tape at the end of the last file and just ahead of the file you wrote. Now VERIFY the file you saved.

6) BUFFER — returns the contents of the buffer. If the tape buffer is empty, a message informs you of that fact. If it contains a file, the name of the file, file type and free bytes (in Hex) are displayed. If more than one file is in the buffer, only the name and type of the last file read in will be displayed, but the memory available will reflect the presence of all files contained in the buffer.

7) INDEX — provides you with a catalog of all the files on a tape. You may request a simple index with only the filenames displayed, or you may get a full index that includes filename, file type (machine language, BASIC or data) and a description. The description is either the start, load and ending addresses of machine language programs or the data type (ASCII or binary), an indication if the file is gapped and the length of the file in bytes. All numbers are in Hex. The index may be sent to a printer or displayed on the screen. If the printer is used, nothing appears on the screen as the index is being printed.

8) COPY — reads a file into memory (or uses the file currently in the buffer) and writes it back out to tape. You may also designate a new name for the file to be written to tape. The distributors of *T.UTIL* make it crystal clear in their documentation that no effort has been made to allow protected tapes to be copied with this command.

9) EXIT — does just that. If you change your mind, however, it is easy to get back into the program. Just type *EXEC &H65B* and you're back in business.

The Reset button is used as the means of stopping the execution of a command that has gone astray. *EXEC* then returns you to the command prompt. This is helpful if you are, for instance, attempting to read in a file that you have misspelled.

The strangest thing that users of *T.UTIL* will have to get used to is the fact that there is no cursor as you type in commands and instructions. This is not a complaint, just an observation. The backspace arrow works normally so it is easy to correct mistakes, even if you can't see the cursor.

Error handling is made very convenient by the use of four error messages that are spelled out for you. A quick glance at the user's manual explains each one and what to do about it. After the error message is written, the user is returned to the "?" prompt and the program waits for the input of another command.

The documentation for *T.UTIL* is provided in a booklet that contains 19 pages (5½" x 8½"). The documentation is very thoughtfully laid out. It contains General Information, Technical Information, Using the Documentation, Entering Commands, Quick Command Reference, Error Messages, Informational Messages and Sample Sessions. Ease of use is a result of thoughtful planning by the distributor.

Tape users will quickly realize that several of the utilities contained in *T.UTIL* are available from several vendors as separate programs at more than the cost of *T.UTIL*. For the money, I haven't seen any tape utility that can compare to *T.UTIL*. I recommend it.

**(Sadare Software, P.O. Box 3891, Gaithersburg, MD 20878, $12.95)**

**— A. Buddy Hogan**

# *Fractions Tutor* — Half The Work, Four Times The Fun

"Okay, class. Multiply the numerator by the denominator and reduce to the least common multiple by factoring both." I remember sitting in math class back in the sixth or seventh grade and trying to decipher the instructions before attempting the math problem. Of course, back then computers in the classroom did not exist. I got through fractions, but it was not as easy as it could have been. Life would have been better if I had a little CoCo every day.

I must admit that I also reviewed *Factors Tutor*, by the same author as the *Fractions Tutor*, and it certainly helped me to refresh my mathematical expertise. The author, Ed Guy, should be a school teacher, if he isn't. He does an excellent job of presenting mathematics in these programs. I like his style.

I stated that it helped me to have reviewed *Factors Tutor* because these programs do not have the beginning introduction of directions. You do need some background in working with fractions but the author does not leave you high and dry. Each program has a "help" that tells you how to accomplish a solution to the problem you are working on. You are not automatically given the answer, but rather the system you need to figure out the answer. You must use your head to get the answer. I like that. "Learning will not take place if the problem is too easy or too hard" — I said that. Ed Guy's programs work that way.

All of Ed Guy's programs begin with allowing you to decide if you want to determine the numbers for the problems or have the computer decide. You then enter which level you want, one through four. Level one is easier than level four. Each program uses low resolution to draw the problems on the screen.

I started with multiplication. The first step is to change the numbers to improper fractions. By the way, you get three chances to give the correct answer before the computer tells you what it is, but after your second try the computer gives you directions automatically. The next step is to cancel common factors and finally do the multiplication. If the answer is not in lowest terms you must reduce. *Fractions Tutor* follows logical and correct progression for doing the mathematical problem. All problems are drawn and worked out horizontally on the screen. Ed Guy incorporates a neat combination of sound and movement for transposing your answers into the original problem. It is too much to describe, but let me say that it is enjoyable and holds the student's interest.

Next, I went to the program for adding fractions. You start off the same way as multiplying, by choosing to input the numbers or allowing the computer to choose and then deciding upon levels one through four. I chose level one (have to keep up self-confidence). The problem appears horizontally and you are prompted to give the lowest common denominator. Then you multiply the numerator and the denominator. The answer has to be in lowest terms. Of course, it has a "help" with excellent explanations.

Next I tried the subtraction program. It starts the same way as the others. You are prompted to subtract the whole numbers first. Then change the fractions to the least common multiple in order to subtract them. When you go to subtract the numerators (that is the top number), you must make sure that it is possible to perform the subtraction (i.e., you cannot subtract twelve from nine and come up with a negative number). The program prompts you to borrow from the whole number and make an improper fraction. Then continue with the example and reduce the answer to lowest terms.

Every program performs very well. But there was a problem. When entering an answer my finger missed the ENTER key and hit the CLEAR key. My screen was gone! No numbers for me to see! But the program continued asking me to answer the questions. My responses continued to appear on the blank screen without me knowing what was happening. The program should include a poke to disable the CLEAR key.

Ed Guy has done a fantastic job with these programs. They are well worth the money. But as the instructions from Computer Island state, "Of course, no program can truly be a substitute for a real, live teacher."

**(Computer Island, Dept. R, 227 Hampton Green, Staten Island, NY 10312, each program [*Fractions Tutor — Addition, Subtraction* and *Multiplication*] is $19.95, $29 for two)**

**— Michael F. Garozzo**

RETURN OF THE JET-I

If you liked the forest chase scene, you'll love RETURN OF THE JET-I from ThunderVision.

RAINBOW CERTIFICATION SEAL

Possibly the best game you have ever played on your color computer!

Reviewed in the April 1984 issue of RAINBOW.

16K cassette, one or two players . . . $24.95

Available only from ThunderVision, makers of JOWST

Dealer Inquiries Welcome.
Pay by check, Money
Order, C.O.D. or

VISA
MasterCard

THUNDERVISION
P.O. Box 30012
Grand Junction, Colorado 81503
(303) 245-4208
*Write for our **FREE** catalog.*

• We Pay Shipping •

# *Electronic Graph:* Math Functions In *PMODE 4*

*Electronic Graph* is designed to display a two-dimensional representation of higher math functions on a *PMODE 4* screen with an option for dumping the graphic screen to a LP VII or compatible printer.

It supports 14 functions that include *ABS, ATN, COS, EXP, FIX, INT, LOG, SGN, SIN, SQR, TAN,* 'N' to the 'M' power, 'N' to the 'M' root and PI up to nine digits. All calculations within the program are done using BASIC commands, while the screen dump to printer appears to be in machine language contained in data statements.

After *CLOADing* it from tape and running it, the program displays the title screen in flashing text characters while the program is reading ML data statements and poking them into memory. After about 15 seconds the display changes to the parameters text screen where you are led through the process of entering the function, variables and display parameters. The program comes already set up for the *SIN* function to act as a demo.

The current function (*COS, SQR, SIN,* etc.) is displayed near the center of the screen and you are asked if this is correct. You reply with 'Y' or 'N'. Press 'N' to enter the desired function, which is in turn displayed where the old one was. Again you are asked if the function is correct as above.

The next prompt is for using an overlayed graph. Selection 'N' will clear the graphic screen before plotting the function while pressing a 'Y' key will allow you to overlay the new function or variable curve over the previous one. This feature is handy for comparisons and is one of the strongest points of *Electronic Graph.* You may overlay as many times as you want, but it gets a little crowded after three or four times since two color *PMODE4* graphics is used.

You need to enter four numbers (either positive or negative) to define the minimum and maximum values for X and Y. On startup, the program contains default values for the demo curve. These values are used to create a screen grid to plot the function on.

The following prompt is to select a continuous plot line. A 'Y' or 'N' response will set this option accordingly.

Lastly, you select one of three graph textures that also affects the speed of the plotting. Select 'S' for smooth curves using all points, 'M' for medium to only use every other point, or 'R' for rough that uses every fourth point. This feature is very helpful when creating overlayed screens to tell the various curves from one another. If, for example, you intend to plot the same function using three sets of variables or three functions using the same or different variables, you can select varied textures for visual clarity.

After having done all this, the graphic screen comes up and the actual math process begins. If the overlay option was not selected, the screen is *CLEARed* to solid black. Then right before your eyes you see a plotting of a two-dimensional representation of the equation over the specified range. Using the smooth plot option, the average display completion time is about 15 seconds and gives the most attractive and detailed format possible using the highest resolution capability of the Color Computer. Using the medium or rough option cuts the completion time down proportionately.

When the graphic plotting is completed the color set changes from green on black to buff on black to tell you it's finished. The display remains on screen until you press a key and a text prompt asks you if you want hardcopy. 'N' will return you to the function screen and 'Y' will dump the graphic screen to your line printer and then return you to the function screen to do another.

The documentation says that the screen dump will work with LP VII or compatible printers. Since I do not have a LP VII available to me I cannot verify correct operation of this feature. Perhaps future versions will allow selection of various printer models.

This program is relatively user friendly. I say relatively because the program has idiot traps to reject incorrect user response during all prompts except when you enter the equation. It is possible if not easy, at least at first, to enter the equation incorrectly and not know it until you have gone through selecting all the other options and then see it bomb when the graphic plotting begins. A desirable feature missing was the ability to take another look at the graphic screen after you have exited to do another equation from the main menu but before entering a new equation. The screen contents are still there in memory and it would be a simple matter to add this feature with a few BASIC lines.

The program will load but not run if disks are plugged in and I found this to be a severe inconvenience. Not since I learned how to backup ROM packs have I unplugged the disk controller nor would I start doing it on a regular basis just to run one program. The program assumes that you have a 16K RAM cassette CoCo and nothing more even if

COLOR COMPUTER Buyers Club

- Members enjoy a 25-40% savings on software!
- Over 500 programs from 38 companies to choose from!
- More software constantly being added!
- Hardware & accessories at substantial savings!
- Special order service for members!
- No service charge for VISA or MC!
- Your savings can far exceed your dues!

Join Today and Start Saving!

Dues are $24.50 - We accept
Personal Checks, M.O. or Charge It!

NAME ______
ADDRESS ______
CITY ______ STATE ______ ZIP ______
☐ VISA ☐ MC ______
Exp. Date ______ Bank # ______ (MC only)

Mail to: Color Computer Buyers Club
P.O. Box 241
Eaton Rapids, MI 48827

you do. A few peeks in housekeeping RAM could tell the program how much memory is available and if disks are present to set the program up for any CoCo configuration except 16K disk which would not be enough to run the program and operate a disk. I found that by changing some of the *CLEAR* and *POKE* statements within the program I could get the program to work with my 64K disk system with some screen garbage but with the math and graphic functions working accurately.

The documentation consists of a 5″ by 8″ seven-page booklet that gives you all the information you need to operate the program but it does assume a working knowledge of the math functions and formulating equations for it to have any relevance. It could be used as a training aid in learning or refreshing your knowledge on this subject and because of this the program could be classified to fall somewhere between a utility and an educational program.

When I first received the program to review I was less than elated because I barely made it through high school algebra class and I could never find a good, real-world application for it and it was hard for me to conceptualize what was going on. Determined to give this program a fair and somewhat knowledgeable review, I ventured up to the attic to find one of my old high school textbooks for reference and a crash refresher course. It wasn't too hard to find the book when I subtracted the number of years since high school from the number of rows of boxes and found that equation worked! I wonder if the program could plot that?

Using that old school book and *Electronic Graph*, I found that all these mysterious formulas and equations started making more sense when I could see a graphic representation of what was happening. Because of this, my comprehension and ability to apply these concepts increased dramatically. Visual aids have long been recognized as a powerful learning tool with computers playing an ever increasing role and this program taps some of this potential in a subject area that seems to be overlooked by software vendors. While not for children, *Electronic Graph* could be used by a high school or college student in connection with their math studies with good results.

*Electronic Graph* does everything it claims to do for a price that is reasonable. If higher math functions interest you, I would recommend adding this program to your software library.

**(Valhalla Enterprises, P.O. Box 243, Sumner, WA, 98390, $14.56)**

**— J. Michael Nowicki**

COLOR CABLES

RS-232 Printer Cables 10 ft $15.00

3 ft Disk cables

1-drive $27.95 2-drives $35.00

3-drives $40.95 4-drives $45.95

Disk or Game Cartridge Ext., 3 ft $27.95

Gold Plated Disk I/F solder plug $11.95

Custom Cables upon request

Extra length of any cables at $1.00/ft

Add $1.75 for shipping and handling

Kansas residents add 3% tax

C & C Engineering

P.O. Box 8320 Wichita, Ks 67208

## *Dump* And *Memory*: Two Patches In One

Disk Bump? Yes, the heading on the instruction sheet stated "Disk Bump/Patch Utility." Off to a bumpy start with this one, I thought. As it turned out, the first line of the introduction renamed this utility *Disk Dump/Patch*. I think I like "Disk Bump" better. A group called Softworks has come up with actually two utilities in one package; the second, *Memory Dump/Patch*, did not have a typo on the instruction sheet heading. Both of these programs allow the user to manipulate disk or memory data.

The disk utility is the more complex of the two programs, simply because of the versatility and power of the disk operating system. After this machine language program is loaded, type *EXEC* and hit ENTER. A few seconds later your drive will start up, ready or not, and your screen will be filled with all kinds of information. This is the start default mode and what you have on your screen is the first 128 bytes of track 17, sector 3, better known as the directory. Big deal, you say. Well, if you have ever had a directory crash, this program could get you up and running again. How many of you have every disk backed up? Very few hands raised, I'll wager. That reinforces an old computer rule, "the unbacked-up disk crasheth first." At this point, the user can modify any one of the 32 bytes that make up each directory entry. Simply moving the cursor with the arrow keys and typing over the byte of interest is all that is required; you can easily unkill a killed file, for instance. Other functions allow you to jump to any other track or sector and, once there, scroll forward or backward through sectors. Reverse video, auto repeat keys and Hex or decimal notation of track and sector information are also included. An ASCII area is also provided on screen and corresponds to the Hex data of the 128-byte "page" you are looking at.

*Memory Dump/Patch's* screen information is similar to the disk except memory locations can be chosen instead of track and sector. Once again you can scroll forward through memory or reverse, and all the time the screen is displaying Hex and ASCII data. A print command is also available which gives the user a hard copy to help document changes. After data changes have been made in either the disk or memory program, a separate command is used to insert these changes, but the user is prompted before this happens if it's necessary to "bail out."

There are four brief pages of *Disk* and two pages of *Memory Dump/Patch* instructions. These have several spelling errors and the before-mentioned typos, a disappointment in an otherwise fine package.

**(Logical Computer Products, P.O. Box 125-S121, Arlington, MA 02174; Silicon Rainbow Products, 1111 W. El Camino Real, Suite 109, Sunnyvale, CA 94087, disk $22)**

**— Ron Hansen**

see us at RAINBOWfest CHICAGO

## THE PEEPER

A Unique Interrupt-Based Program Tracer
From Spectro Systems

Imaging being able to monitor the operation of a machine-language program While It Is Running. To display any portion of memory in any of Coco's 26 documented display modes, and to move through memory using the arrow keys. To slow the action to a crawl, or freeze it at will. Instantly switch between watching the output of your program and watching Peeper dynamically display (on screen or printer) the contents of the 6809's registers and stack, showing changes as they are happening. In the slowest speed mode, Peeper provides continuous single-stepping; faster modes give a coarser trace. Or, halt the action and single-step by repeatedly pressing the space bar. Peeper supports breakpoints, memory examine/change, and more. Think how much easier it would be to modify someone else's ML software if you could determine what routines were being executed at any given point!

For fun, (and this requires no ML experience), use Peeper with arcade games, watching the fine details of the animation effects in slow motion. See how the game looks and plays in other graphics modes. Or watch what is happening on "hidden screens" you never see. (Makes a superb demonstration.)

**REQUIRES 16K COCO**
**ON CASSETTE (COPYABLE TO DISK)**
**WITH ASSEMBLER LISTING**

**$24.95**

## FASTAPE

The Next Best Thing To A Disk Drive
From Spectro Systems

Fastape gives you cassette I/O at 3000 baud-Twice Normal Speed. It uses the high-speed (POKE 65495,0) mode, and makes it convenient to stay in this mode throughout. Features automatic adjustment of cassette and printer parameters when speed mode is changed. Control-key functions for many Basic commands and for changing speed modes. Compatible with all tape file types. Can be used with Telewriter-64 and many other utilities.

**"I strongly recommend this fine utility" Rainbow, 7/83**
**"A treat for those without disk systems" Hot Coco, 10/83**

**REQUIRES 16K COCO** **CASSETTE $21.95**

## TAPE-DIR©

Tape-Dir is a basic program used for displaying and/or printing information about cassette files.

In addition to listing file name, Tape-Dir will list and/or print the following information:

1. Type of file - Machine Language, Data, Basic.
2. Format - Binary or ASCII.
3. M/L Start, End, and Execute addresses.
4. For Basic & Data Files - will show number of bytes used! Useful for sorting out your tape files by those that will run on your 16K, 32K machine!
5. Will bypass tape I/O errors - no aggravation!

**REQUIRES 16K EXTENDED COCO, CASSETTE PLAYER.**
**(PRINTER OPTIONAL)**

**CASSETTE $11.99**

## TAPE SPOOLER©

- Re-direct printer output to cassette for later printing or archival.
- Uses 310 byte machine language driver which is appended to basic programs.
- After 1 call, all print#-2 basic statements redirect all printer output to cassette.
- Can be turned on and off while your basic program is running.
- Can write to cassette and printer at same time.
- Absolutely no change to printer formats.
- All control codes normally sent to printer will be captured to the cassette with printed data.
- Supplied utility will print from tape, convert the tape to a disk file, print the converted disk file, and print multiple copies of either the tape or disk (multiple copy function cannot process files greater than 14,790 characters)

** Great for generating 2 seperate reports from the same file on a single pass.
** Use as a "printing press" for generating multiple copies of meeting notices, ads, circulars, you name it!
** Share a printer!!! Take your "Saved Printout" on tape to a friend that has a printer!

**REQUIRES 32K EXT. COCO & CASSETTE**
**(DISK - PRINTER OPTIONAL)**

**CASSETTE $21.95**

## TREK-TRIV

The Star Trek Almost Impossible Super Trivia Quiz
For serious "Trekies" only! All others need not apply!

- Four programs on one cassette
- Trek, Trek II, Quiz and Quiz II
- Sound Effects
- Advance through various sections and receive promotions up to fleet admiral! But if you miss . . . well, you'll find out!
- Receive a print-out of your rating, rank, and intelligence description (sometimes a bit harsh - but only if you deserve it)
- Fun - but V-E-R-Y Challenging.

**REQUIRES 32K COCO, CASSETTE RECORDER**
**SUPPLIED ON CASSETTE - ALL FOR $19.95**

## OS-9
## ★★★★★★ "CONVERT" ★★★★★★

New – From Computize . . .

This high quality M/L Utility will CONVERT Standard OS-9 Formatted Files/Disks (5¼") to Radio Shack OS-9 to run on your COCO. Will also convert 40 track to 35 track if you require. Runs under COCO OS-9.

**REQUIRES 64K COCO AND 2 DRIVES**

**SUPPLIED ON DISK ONLY $49.95**

## SUPER BACK-UP UTILITY©

...WITH S.B.U. FROM COMPUTIZE - YOU'LL NEVER NEED ANOTHER BACK-UP UTILITY FOR YOUR COCO!!!

SUPER BACK-UP UTILITY WILL PERFORM ALL OF THE FOLLOWING FUNCTIONS:

1. **TAPE TO TAPE** (Regardless of most protection schemes!)
2. **TAPE TO DISK** (Move Cassette programs to Disk!)
3. **AUTO RELOCATE** (For those Cassette programs that conflict WITH Disk operating systems.)
4. **DISK TO TAPE** (Place Disk programs onto Cassette)
5. **DISK TO DISK** (Our powerful Spit-N-Image Program, *Regardless of protection schemes!)

* **MENU DRIVEN!**
* **REQUIRES 32K EXTENDED COCO**
* **REQUIRES 1 OR 2 DRIVES** (For Disk Functions)
* **ALL MACHINE LANGUAGE!!!**

**COMPARE WITH OTHER INDIVIDUAL PROGRAMS COSTING IN EXCESS OF $100.00 OR MORE!!!**

**★★★ONLY $49.95!★★★**
(SUPPLIED ON DISK)

## T.T.U. – TRIPLE TRANSFER UTILITY (C)

M/L For Cassette & Disk Program Transfer

Transfer contents of disk to tape * Transfer content of tape to disk * "Select" or "All" Option * Will automatically relocate those cassette programs that conflict with the disk operating system! * Will display machine language program address * Copies ASCII, Basic, & Machine Language Programs * All contained in 1 menu driven program! ! !

**REQUIRES 32K CC EXT.** RAINBOW

**Cassette $19.95** **Disk $24.95**

## SPIT-N-IMAGE (C)

M/L Disk Back-Up Utility

RAINBOW

There is no need to suffer the heartbreak of crashed disks any longer. Spit-N-Image will create a mirror image of your valuable disk programs which do not respond to normal back-up functions. Will also initialize and back-up in one pass. Data processing experts always insist on haviang a back-up – it's good practice – Don't wait!

**REQUIRES 32K CC AND 1 OR MORE DRIVES**
**CASSETTE $29.95** **DISKETTE $34.95**

# GRAPHICOM

**Simply stated - the finest graphics program written for the COCO (or any other computer)!**

## FEATURES

RAINBOW
CERTIFICATION SEAL

- U-S-E-R F-R-I-E-N-D-L-Y!
- 4 Mode (Including Hi-Res Artifact)
- Animate Mode
- Color Palate with over 15 color patterns for use with Hi-Res Artifact
- Send/Receive pictures over standard modem at 300, 600 or 1200 baud
- Supplied utility allows capturing Hi-Res Screens from most COCO arcade type games (Even protected ones)
- Multiple Hi-Res character fonts (user changable & definable)
- Supplied utility for transferring graphicom screens to basic or other M/L Programs
- Supplied utility for loading screens from basic or other sources
- Built in Screen print (Pre-defined for Epson, C-Itoh, RS LP VII, LP VIII, DMP 100, DMP 200, DMP 120, GCP 115, GEMINI 10, and OKI) 110 to 9600 baud
- Slow scan television send/receive options
- Many additional features, operating hints, hardware mods and suggestions, etc. etc.!

**★ EASY TO LEARN GRAPHIC MENU ★**
**REQUIRES 64K COCO - 1 DRIVE - JOYSTICKS**
**SUPPLIED WITH 2 EXTRA PICTURE DISKS FOR MORE CHARACTER FONTS, PICTURES & GRAPHICS!**

**ON DISKS $24.95**

## 64K-IT©

New - From Computize . . .

Enables the Full 64K of RAM in your 64K Color Computer. Provides up to an additional 16K of RAM. Permits you to change, modify or copy the BASIC, EXTENDED BASIC, ROMPACK, OR DISK PACK.

**REQUIRES 64K COCO** **TAPE $11.99**

# COMPUTIZE, INC

**215-946-7260**

**P.O. BOX 207**
**LANGHORNE, PA 19047**

Check or M.O.
MasterCard VISA
Add $2.00 Shipping
PA Res. add 6% sales tax

**WRITE FOR YOUR FREE COPY OF OUR NEW SPRING 1984 CATALOG!**

MAGIGRAPH

# NEW GOOD STUFF FOR EVERY COLOR COMPUTER

Turn your Color Computer into a graphic design center with the ease of a keystroke! **MagiGraph** makes it simple to create highly detailed figures up to and including an entire high-resolution screen. Designed for those with some experience in Basic and Assembly Language programming, **MagiGraph** includes lots of special features:

- **A full set of logical and pixel manipulation functions** simplifies the development of complex figures.
- **An editor** lets you zoom in and work on every detail of your design. Toggle between the "macro" and "micro" screens for perspective on your creations.
- **Nine animation buffers** allow you to preview each sequence to ensure continuity and smooth flow.
- **Versatile I/O routines** store a graphic screen on cassette or floppy disk; recall it later for use by another program or revise it with **MagiGraph**.

If you're looking for the finest graphic development utility available for your Color Computer, THIS IS IT. Maximize your machine's potential, while you push your imagination to the limit — with **MagiGraph**!

By Kevin Dooley. Cassette **$34.95** (16K required); Disk **$39.95** (32K Extended Color BASIC required); Amdisk cartridge **$44.95.**

## CSPOOL

### Color Computer Print Spooler

Stop Waiting Around for the Printer! **CSPOOL** allows you to use your printer and computer concurrently, takes only 26 bytes of Color Basic's memory, and gives you 32K of print buffer. It's like having two computers in one! By intercepting characters sent to the printer and storing them in the upper 32K of RAM, **CSPOOL** allows you to run other programs while your printer is doing its job. **CSPOOL** is FREE with the purchase of a 64K RAM UPGRADE KIT from The Micro Works, or it may be purchased separately on cassette or diskette for **$19.95**. Requires 64K; not for FLEX or OS9.

**64K MEMORY UPGRADE KIT:** For Rev. levels E, ET, NC, TDP-100s, and Color Computer II. Eight prime 64K RAM chips, instructions, and CSPOOL: **$64.95.**

---

## SYSTEMS SOFTWARE

**MACRO-80C: DISK-BASED EDITOR, ASSEMBLER AND MONITOR**—With all the features the serious programmer wants, this package includes a powerful 2-pass macro assembler with conditional assembly, local labels, include files and cross referenced symbol tables. MACRO-80C supports the complete Motorola 6809 instruction set in standard source format. Incorporating all the features of our Rompack-based assembler (SDS-80C), MACRO-80C contains many more useful instructions and pseudo-ops which aid the programmer and add power and flexibility. The screen-oriented editor is designed for efficient and easy editing of assembly language programs. MACRO-80C allows global changes and moving/copying blocks of text. You can edit lines of assembly source which exceed 32 characters. DCBUG is a machine language monitor which allows examining and altering of memory, setting break points, etc.

Editor, assembler and monitor—along with sample programs—come on one Radio Shack compatible disk. Extensive documentation included. By Andy Phelps. **$99.95**

**SDS-80C: SOFTWARE DEVELOPMENT SYSTEM**—Our famous editor, assembler and monitor in Rompack. Like MACRO-80C, it allows the user to write, assemble and debug assembly language programs with no reloading, object patching or other hassles. Supports full 6809 instruction set. Complete manual included. **$89.95**

**MICROTEXT: COMMUNICATIONS VIA YOUR MODEM!** Now you **can** use your printer with your modem! Your computer can be an intelligent printing terminal. Talk to timeshare services or to other personal computers; print simultaneously through a second printer port; and re-display text stored in memory. Download text to Basic programs; dump to a cassette tape, or printer, or both. Microtext can be used with any printer or no printer at all. It features user-configurable duplex/parity for special applications, and can send any ASCII character. You'll find many uses for this general purpose module! ROMPACK includes additional *serial port for printer.* ***$59.95***

### MICRO WORKS COLOR FORTH

- Faster to program in than Basic
- Easier to learn than Assembly Language
- Executes in less time than Basic

The MICRO WORKS COLOR FORTH is a Rompack containing everything you need to run Forth on your Color Computer. COLOR FORTH consists of the standard Forth Interest Group (FIG) implementation of the language plus most of FORTH-79. It has a super screen editor with split screen display. Mass storage is on cassette. COLOR FORTH also contains a decompiler and other aids for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. And COLOR FORTH contains 10K of ROM, leaving **your** RAM for **your** programs! There are simple words to effectively use the Hi-Res Color Computer graphics, joysticks, and sound.

Includes a 112-page manual with a glossary of the system-specific words, a full standard FIG glossary and complete source listing.

MICRO WORKS COLOR FORTH . . . THE BEST! From the leader in FORTH, Talbot Microsystems. **$109.95**

### MACHINE LANGUAGE

**MONITOR TAPE:** A cassette tape which allows you to directly access memory, I/O and registers with a formatted hex display. Great for machine language programming, debugging and learning. It can also send/receive RS232 at up to 9600 baud, including host system download/upload. 19 commands in all. Relocatable and reentrant. **CBUG TAPE: $29.95**

**MONITOR ROM:** The same program as above, supplied in 2716 EPROM. This allows you to use the entire RAM space. And you don't need to reload the monitor each time you use it. The EPROM plugs into the Extended Basic ROM Socket or the Romless Pack I. **CBUG ROM: $39.95**

**SOURCE GENERATOR:** This package is a disassembler which runs on the Color Computer and generates your own source listing of the BASIC interpreter ROM. Also included is a documentation package which gives useful ROM entry points, complete memory map, I/O hardware details and more. A 16K system is required for the use of this cassette. **80C Disassembler: $49.95**

## HARDWARE

**PARALLEL PRINTER INTERFACE**—Serial to parallel converter allows use of all standard parallel printers. PI80C plugs into the serial output port, leaving your Rompack slot free. You supply the printer cable. **PI80C: $59.95**

**SUPER-PRO KEYBOARD—$69.95** (For computers manufactured after Oct. 1982, add $4.95)

**ROMLESS PACKS** for your custom EPROMS — call or write for information.

## BOOKS

**6809 ASSEMBLY LANGUAGE PROGRAMMING**, by Lance Leventhal, **$18.95**

**TRS-80 COLOR COMPUTER GRAPHICS**, by Don Inman, **$14.95**

**ASSEMBLY LANGUAGE GRAPHICS FOR THE TRS-80 COLOR COMPUTER**, by Don Inman, **$14.95**

**STARTING FORTH**, by L. Brodie, **$17.95**

## GAMES

**ZAXXON**—The real thing. Excellent. What more can we say? Cassette requires 32K. **$39.95**

**STAR BLASTER**—Blast your way through an asteroid field in this action-packed Hi-Res graphics game. Available in ROMPACK; requires 16K. **$39.95**

**PAC ATTACK**—Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. **$24.95**

**HAYWIRE**—Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. **$24.95**

**ADVENTURE**—*Black Sanctum* and *Calixto Island* by Mark Data Products. Each cassette requires 16K. **$19.95** each.

**CAVE HUNTER**—Experience vivid colors, bizarre sounds and eerie creatures as you wind your way through a cave maze in search of gold treasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version. **$24.95**

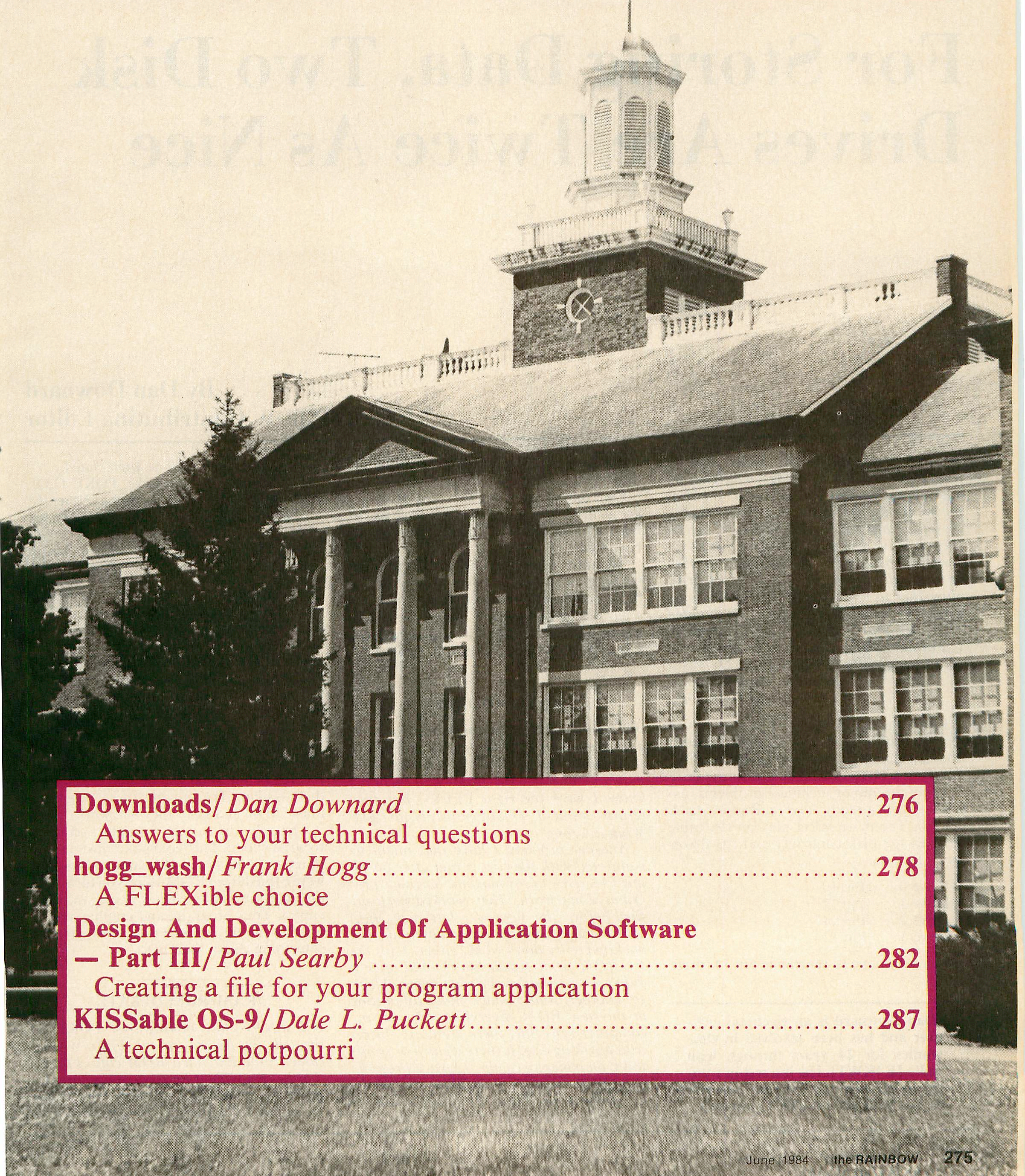
THE MICRO WORKS

P.O. BOX 1110-A
Del Mar, CA 92014
(619) 942-2400

California Residents add 6% Tax

**Master Charge/Visa and COD Accepted**

# RAINBOW TECH



**Downloads/** *Dan Downard* .................................................. 276
Answers to your technical questions

**hogg_wash/** *Frank Hogg* .................................................. 278
A FLEXible choice

**Design And Development Of Application Software — Part III/** *Paul Searby* .................................................. 282
Creating a file for your program application

**KISSable OS-9/** *Dale L. Puckett* .................................................. 287
A technical potpourri

# For Storing Data, Two Disk Drives Are Twice As Nice

**By Dan Downard**
**RAINBOW Contributing Editor**

• *I own a standard Radio Shack drive 0; would there be any advantage in purchasing a double-sided disk drive now? What is meant by interfacing a non Radio Shack disk drive and what does it involve? Can it be used as drive 1 in Radio Shack Disk* BASIC *and will it be useful as drives 1 and 2 in OS-9 or must I disconnect my Radio Shack drive altogether to make use of the double-sided drive? In other words, does single-sided drive plus double-sided drive equal drives 0, 1, 2 or not? If not, wouldn't I be just as well off to buy the Radio Shack drive 1?*

*Raul Gonzalez*
*Coral Gables, FL*

Raul, the main reason I would buy a second drive is for data storage. Since a double-sided drive will hold twice the information it would seem to be a wise choice.

There are minor technical problems, assuming you already have a Radio Shack drive 0. The drive select pins on the cable between the disk controller and the drives are as follows:

| | |
|---|---|
| Drive 0 | Pin 10 |
| Drive 1 | Pin 12 |
| Drive 2 | Pin 14 |
| Drive 3 | Pin 32 |

You may have to rearrange pin 14 (drive select 2) to go to the proper pin for side 2 of the particular drive you buy.

**(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio [K4KWT]. His interest in computers began about five years ago and he has built several 68XX systems.)**

Side one of your double-sided drive will act as drive 1 under Disk Extended BASIC, but FLEX or OS-9 will be necessary to use both sides.

The reference I previously made to interfacing non-standard drives was aimed at those people who thought they could buy a separate controller, cable, bare drive, power supply and case, and put them all together. It can be done but I don't know if it's worth it.

### A NEW ADDRESS

• *I have a 64K CoCo as per your March '83 article and one disk drive. My problem is that the* PEEKs *for finding the addresses of machine language programs don't work. I know I have the right* PEEKs, *but they return 0's and -1. This obviously is not right. What is wrong?*

*Another problem I have that might be connected with the first is that after installing 64K a few of my machine language programs don't work. They worked perfectly fine before the upgrade, but now they,* Storm *and* Berserk, *don't do anything. The backup copies don't work, either. I got the 1.1 ROM from Radio Shack, and after it didn't work, coupled with not being able to get another, Radio Shack ended up putting in the new ROM. Everything else on my computer runs fine; there are no problems with anything else. Is there a glitch or something on a memory chip? I have a program that checks out all of the 64K memory, and it brings back an "OK." Any suggestions on what I could do would be appreciated.*

*Concerning the cold poke,* POKE 113,0: EXEC40999. *My machine does not reset the graphics screen. Is everything reset with this poke, or are just some areas reset?*

*Kevin Marsh*
*Bokeelia, FL*

The problem is not with 64K but the fact that you are using disk drives, Kevin. The addresses you peek for tape are no longer valid. To find the proper addresses see Dennis Derringer's article "A Change of Address" in the May 1984 RAINBOW. If you just want to find the address just hit ENTER when you are asked for "New Load Address =".

This program may also solve your problems with *Storm* and *Berserk*, but I can't guarantee it. Machine language programs located below $E00 will no longer run on a disk system. Try moving these programs above $E00 and see if they will work.

The only way to reset a graphics screen is to write over it. The "cold poke" just sets the pointers in BASIC to the same values that were copied from ROM when you turned on the machine. At no time is any memory erased. Your program, and graphic screens for that matter, are still there until you put something else in their place.

### RAM/ROM DEBATE

• *I was recently poking (not* POKEing*) through the innards of my CoCo when I came to the Extended ROM chip. I found that by removing it I increased my "usable" RAM by about 7K. I remember that in the December 1983 issue, your magazine taught* *me how to construct a ROM switcher. Is it possible to construct an on/off switch for the Extended ROM? If so, how would it be done?*

*I have seen many advertisements for a "CoCo Pilot Light." After leaving my computer on for two days (I thought I had killed it), this idea sounds very useful. It seems it is just a matter of knowing where to connect the wires from the diode to the computer. Do you know where I should hook them? I have a technical reference guide but I can't make heads or tails of it. Where should I "hook" the wires so it won't affect the computer?*

*Charles Edmonds*
*Fort Worth, TX*

I see no need for a switch to disable the Extended ROM, Charles. The 7K you are referring to is only accessible in the 64K mode and several programs to move the Extended ROM to a higher address have appeared in THE RAINBOW. If you would disable the ROM you would lose all of your Extended commands.

You can hook an LED through a 220 Ohm resistor to any 5-volt source in the computer and it should work fine. If you are not using your joysticks there are 5 volts between pins 5 (+) and 3 (-) of each joystick connector.

### MODEL I MONITOR

• *I recently purchased the CoCo 64K Extended Color BASIC. I also purchased a color monitor which I was able to use on the CoCo with minor modifications (tapped into video input to RF modulator). I'll be using the color monitor for games and graphics, but I would like to use a black and white monitor for word processing. I was thinking of using my black and white video monitor from my old TRS-80 Model I. I added a +5 V supply to drive the video interface board in the monitor. When I connected the monitor to the video output of the CoCo, the display was visible, but the border and text distorted in a wave-like motion.*

*Any ideas on how I can match the CoCo output to the Model I video monitor?*

*Frank S. Wagner*
*S. Hamilton, MA*

You are on the right track, Frank. The video interface in the Model I monitor requires a separate 5-volt supply, which you have evidently already built. That seems to be your problem. I would check your power supply for proper filtering.

Jim Russell, a local ham operator, had the same problem. He was using a 5-volt regulator that was oscillating. Replacing the regulator cured the problem.

### FAVORS FANCY FONTS

• *First let me say "Downloads" and* THE RAINBOW *are really educational. I've learned a lot from you folks. Thanks.*

*I write, edit and lay out a newsletter. It's all done on my Radio Shack 64K Color Computer, and I often have a need for fancy fonts — especially large fonts for titles and logos. I use a Radio Shack DMP-200, two disk drives and the* VIP Writer.

*Is there a program out there I can use to type out and print a variety of large and/or fancy fonts?*

*Robert Mauro*
*Levittown, NY*

Look at the ads in this issue for *Master Design* by Derringer Software. It seems to be just what you are looking for, Robert. Quite a bit cheaper than a typesetter, too.

### LEARNING NEW LANGUAGES

• *I have 32K and a disk drive and have learned BASIC. Now I want to learn a second programming language and machine language. C language sounded good since (if I understand correctly) you can enter source code just as easily as a C program; however, the C compiler is relatively limited. Because of this maybe FORTH would be better for me. What are your ideas on this? Your help would be greatly appreciated.*

*Joel Ashford*
*Ethel, LA*

Joel, I think Frank Hogg answered a question similar to yours very well at the recent RAINBOWfest in New Brunswick. He was comparing operating systems, but comparing languages is similar. To paraphrase Frank, "Languages (and operating systems) are just tools to achieve a mean." Otherwise, don't be concerned with the language as much as the user programs available.

At present there are several versions of BASIC, PASCAL, C, COBOL and probably a few other languages available on the CoCo. Which one's the best? We could fill this magazine with everyone's opinions.

For more information on C, see November 1983 RAINBOW for an excellent tutorial by Richard White. Frank Hogg's column in May 1984 RAINBOW contains a short description of FORTH.

### DISK ASCII SAVES

• *I enjoy your department very much. I wish it was longer.*

*The "technical" question I have is in regard to the use of the Disk ASCII save. I have a 64K upgraded "F" board with one drive. I am having a particular problem with one program that does the following:*

*I load in the program and it works fine. I save it by entering* "FILENAME/ASC",A. *When I try to load and run the ASCII saved program, it locks up the computer. If I reset, I can* LIST. *When I try to* EDIT, *I can make changes on the screen, but afterwards, if I* LIST, *the original returns without my changes.*

*Using* TRON *I have traced the problem to line 840 that has* X = USR(0).

*It is a mailing list program that begins:*

```
10 DEFUSR0=PEEK(27)*256+PEEK
(28)-11
11 IFPEEK(267)=174THENPOKEPEEK
(27)*256+PEEK(28)-10,14:GOTO840
ELSE840

840 X=USR(0):GOTO20
```

*Is there some kind of quirk to the CoCo that causes problems with ASCII saves and the* USR *function?*

*I also run into problems if I try to use my* Telewriter-64 *to make changes with this same program and then save it to disk.*

*Thanks for your help. I like your using the person's first name in your response. It adds a nice personal touch.*

*Richard Steinbrueck*
*Dunedin, FL*

I don't think your problem has anything to do with the fact that the program is saved in ASCII, Richard. Your problem seems to be in the machine language program that is being called by your BASIC program. That's why you are having trouble with line 840. Your computer will lock up if there's no machine language program at the proper address when the *USR* function is encountered.

Line 10 of the program in your letter defines the entry point of your machine language program as 11 bytes less than the next line of your current BASIC program. That's a very unusual location.

I would verify that there is, in fact, a machine language program located at this address. Line 840 is the actual location in the program where the machine language program is accessed. Be sure the ML program is terminated with a RTS instruction, or decimal 57.

### "ET" LIVES

• *Concerning your answer to Glen Asmonson on Page 289 of March 1984* RAINBOW, *the gentleman is correct by saying he had an "ET" board. Spectrum Projects has seen and upgraded every CoCo from the "C" board to the CoCo 2. The infamous "F" board can also be identified by "ET," "NC," 285! Some "F" boards had "ET" on them and some had "NC." The "ET" stands for External Transformer. Also, the CoCo 2 now has a revision "B" board! Hope this helps!*

*Bob (Chairman of the "Boards") Rosen*
*Spectrum Projects*

Thanks, Bob. Maybe out there in San Jose you will find the missing "A" and "B" boards.

**Your technical questions are welcomed. Please address them to: Downloads, THE RAINBOW, P.O. Box 209, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity.**

RAINBOWTECH

## hogg_wash

# OS-9? FLEX? Or Both?

**By Frank Hogg**
**RAINBOW Contributing Editor**

The best choice that perplexed Color Computer owners (who can't decide between OS-9 and FLEX), can make is to buy both. The CoCo can be switched from OS-9 to FLEX and back, just by rebooting. With O-Pak's *XCopy*, it is easy to copy files from one type of disk to another.

The same is true for owners of OS-9 Level II systems (such as those made by GIMIX). Actually, their problem is even worse; *XCopy* won't work on anything but a CoCo.

Thanks to a new development by FHL, this situation is changing for Level II system owners.

"Don't spurn me, Dear Reader," as Isaac Asimov might write; someday, you too, may own a Level II system. Unfortunately, what we're about to describe just

can't be done
in Level One.

This poetic lament should become the motto of our demands to Fort Worth. It seems that nearly every time we come upon, or create, some OS-9 goody that's so good we just *have* to tell you about it, it "can't be done / in Level One." But we'll keep trying.

Anyway, we've developed and licensed O-Flex to GIMIX, and they have made it available for their Level II and Level III OS-9 systems — providing a tremendous advantage to owners of those systems. O-Flex has already been an incredible help to our development and testing activities here at FHL. It allows FLEX activities to be done on the *big system*.

As you may know, we own a GIMIX Level III system with four 6809s, 384K of RAM, and a hard disk. It is an OS-9 system — FLEX doesn't know how to use that much hardware. But we support, and sell, and develop, FLEX software all the time. Until recently, we had to use a CoCo for all our FLEX activities. Now a CoCo is not a bad thing at all and should not be denigrated in any fashion; having a CoCo with just about every piece of software that FHL sells would be even less of a bad thing. But, having a CoCo with every piece of software that FHL sells, on three hundred sloppy and poorly organized floppy disks, sitting within ten feet of a Hard Disk System is, well . . . maybe there's a better way.

But what does O-Flex do? How does it work? Well, the heart of O-Flex is an OS-9 program called *OFlex*. *OFlex* is not very big. It has almost exactly 2K. However, the first thing it does is demand 56K of Static Storage. Yes, *that's* why it "can't be done / on Level One." On a Level II system, OS-9 itself is switched out of the 6809's address space just like Color BASIC is switched out of the address space when OS-9 or FLEX is run on the CoCo. When a program hits an "OS-9" instruction, the user program gets switched out and OS-9 comes in. This is how a Level II system can use so much memory and run such *big* programs.

About that 56K of memory we mentioned above — well, that's just enough to load in FLEX at its proper address with all the standard space for user programs, and run it. *OFlex*, (the OS-9 program), includes I/O and disk "drivers" which handle I/O requests from FLEX (the DOS), translating them to OS-9 system calls as appropriate.

*OFlex*, and FLEX, and whatever is running under it (for example, XBASIC and General Ledger), is just another OS-9 program, making ordinary I/O requests and behaving in an ordinary way. As for FLEX, and whatever is running under it is concerned, *OFlex*, and OS-9 Level II, and the computer that's running them, is just a computer that's

---

*(Frank Hogg is the president of Frank Hogg Laboratory, one of the world's largest suppliers of software for 6809 based computers. He and his wife, Linda, live in Syracuse, N.Y.)*

capable of running FLEX.

As far as the user is concerned — well, here we have a few things that we see nowhere else! What do I have before me, but the prompt "OS9:"? Okay, I'll type "OFlex." Now what do I have before me, but "+++"! Now let me type "os9" and, lo and behold, I am looking at "OS9:" again.

Let's play with this neat thing a little! I'll type "OFlex" again. Okay, now I see "+++". Now I put an ordinary FLEX floppy disk in my computer's number-zero floppy disk drive, and I type "ASNDISK 1=/d0@", and then "CAT 1". Yes, that's a directory of that floppy disk! But I want these files on the hard disk — only the hard disk is an OS-9 hard disk. No problem! I type the command "NEWDISK FlexDisk DISK 1 40 18" and an OS-9 file is created, named "FlexDisk", which has just as many sectors as a 40-track, double-density FLEX disk. Then I type "ASNDISK 2=FlexDisk" and that file becomes Drive 2. Now I type "COPY 1 2" and all those files get copied onto "FlexDisk."

The ASNDISK command essentially pulls a floppy disk out of a drive and puts another one in. The only difference is that the "floppy disk" is an OS-9 file, and the "drive" is a software "pseudo" drive. Of course, with the "ASNDISK 1=/d0@" syntax, the pseudo-drive gets connected to a normal drive as it should be.

What else can I do? — shades of O-Pak, Batman, here's an *XCOPY* command! Only thing is, this one runs under FLEX — it's named XCOPY.CMD. Only, here (if we could see the source) would we see the instructions "os9 I$Open" (to open an OS-9 file), and "JSR FMSCAL," (to open a FLEX file) in the same program. This *XCOPY* has two operating systems within its grasp! And, yes, it copies arbitrary files between FLEX and OS-9.

> *"The big advantage . . . is that User A can run FLEX, and User B can run OS-9, and they're using the same computer, and the same hard disk, at the same time!"*

There's also a SHELL command. This allows you to access OS-9 from inside of FLEX. If you type "SHELL", you get an OS-9 prompt, which returns you to FLEX when you type an escape (this would normally log you off). If you type a "SHELL <command>" it will run the OS-9 command given and return right back to FLEX. You can even do "SHELL OFlex"! The result is a FLEX within a FLEX. When you type "OS-9", from the second FLEX, you get back to the first FLEX.

The user of this system is given other unique advantages. FLEX running under O-Flex, has true type-ahead capability. This means that you can begin typing a command before the prompt appears. The big advantage, of course, is that User A can run FLEX, and User B can run OS-9, and they're using the same computer, and the same hard disk, at the same time!

O-FLEX was developed by Rich Hogg, who developed the original FHL FLEX package and many of the later enhancements, and who also wrote O-Pak. At the present time, O-FLEX is available from GIMIX for GIMIX computers only, at a cost of $250.

The major disadvantage of OS-9 is that most of the available software only runs under FLEX. If you want to run this FLEX software then you have to run FLEX. This isn't all that bad on a Color Computer but taking a big multiuser GIMIX system and making it a single user system just to run some programs is a drag. With O-FLEX, you can run that FLEX software on the big multiuser system at the same time that other people are running OS-9 software. As a matter of fact several people can run FLEX software while several people are running OS-9 software on the *same* computer at the *same* time! This makes FLEX multiuser and gives you a system that can run *two* operating systems at the *same* time! I don't think any other computer can do that.

I was playing around with the new *eFORTH* for FLEX that we sell, and I put it up on O-FLEX. FORTH is also kind of its own operating system, so that gave us FORTH running under FLEX, which was running under OS-9. You can make OS-9 system calls from within a FLEX program running under O-FLEX.

### Chicago RAINBOWfest

Would you like a chance to play with a system like this? GIMIX is going to be at the Chicago RAINBOWfest in the booth next to ours. They are only going to bring one computer, but it will be a GIMIX III with a 70-meg hard disk, 5-meg removable hard disk, floppy and one megabyte of RAM. They will have a *dozen* or so, terminals and they plan to let you play with them to your heart's content. We will have *all* our software on the system in both FLEX and OS-9 so you can see how it works on a computer that costs just a little bit more than a CoCo. We will be demonstrating our new software and answering your questions. Stop by the booth and say hello.

### New Brunswick RAINBOWfest

I just got back from the New Brunswick RAINBOWfest and it was the best ever. People were shoulder to shoulder and there was a lot of new stuff to see and buy. Across the aisle from us, PBJ was showing the WordPak video display which allows a 25 by 80 display. I picked one up and plugged it in and it ran fine, right off. They have software for both FHL FLEX and OS-9 so you can run it with either system. Most of the FLEX software works with minor modifications. The OS-9 software is mostly the same.

One problem is noted with *DynaStar* on OS-9. The low-cost version of *DynaStar* was designed to work with O-Pak, and in fact, O-Pak was designed to make it easy for *DynaStar* to work. For instance, *DynaStar* is able to scroll sideways because that is built into O-Pak. *DynaStar* also uses the delete and insert line that is part of O-Pak to speed things up. Finally, *DynaStar* makes a system call to O-Pak to determine the screen size and configures itself to it. It should be obvious why this version does not work with WordPak. The software for WordPak just doesn't do the things that O-Pak does.

We have been telling people that the only way to run *DynaStar* on WordPak is to buy the more expensive version that can be configured to any terminal. Several people have gotten very upset with us because they think they are being penalized because they bought WordPak instead of O-Pak. I can understand why they would think that, but you can see that this is not true. Now that we have a WordPak in our hands we will be bringing out a version of OS-9 *DynaStar* sometime this summer at the lower price. Until then, you will have to get the more expensive version. Sorry.

A hard disk for CoCo was displayed at RAINBOWfest by a company from Canada. I don't have all the details as yet because I was very busy myself. However, they are coming to our office next week to discuss putting FLEX on the system. I will have much more information then. At this time, I think they only have drivers for Disk BASIC. They do plan drivers for OS-9. If we can agree, we will do the drivers for FLEX. Between WordPak and this hard disk, the CoCo can really do a job as a serious computer for business or whatever. I will give a more detailed report next month after I've had time to evaluate this system.

I didn't get the time to really look at the other booths at the show, but I will pass this along to you. There were many bargains in both hardware and software. Several companies were selling disk drives less than wholesale and there were all kinds of new goodies around. Try to attend one of these RAINBOWfests if you can, and bring money. You can get some good buys and also see and meet the people you only read about otherwise. We will be at all the RAINBOWfests loaded for bear, with lots of stuff for you to see and a few bargains to boot.

See you in Chicago!

**Letters**

I have received only a few letters about my column. This either means that you like what I write so much you see no need to write or that nobody reads my column. Either way, without some feedback from you, I will plow on writing about whatever comes into my mind. I know you don't want that, so write with your suggestions!

A couple of issues back, I mentioned that you could free up some memory by making a new boot file leaving out some unneeded modules. One fellow wrote me, very upset that I would suggest that anyone remove anything from OS-9. Jeez, all I suggested was that it was an *option*; I didn't mean to make it forever! The main discussion was about the pipes of OS-9. These things are used to pass data from one process to another without going to a disk file first. In OS-9, you must have enough memory to run all the processes that you are piping. On the CoCo that is darn limited. I felt that for this reason, most people would not make practical use of the pipes and, therefore, it would be no big loss to not have them all the time. Remember, you can boot up on the regular system when you want the works, but you should boot up on the smaller system when memory is more important.

Just how do you go about making the system without the extra stuff? This was the question the other letters were asking. Let me first say something that is most important. *Read the manuals!* Everything you need to know is buried in there somewhere. Don't call me if you can't figure it out until after you have read the manuals at least *three* times. After you wade through them three times, you will either know more than me or you will be stark raving mad. The point is that you cannot digest a complex system like OS-9 without a great deal of effort on *your* part. The only thing you will accomplish by calling me, is to put more profit into AT&T.

However, let me go over it very briefly to give you an idea of how to approach the problem. Sit down in front of your CoCo and boot in OS-9. Now type "mdir" without the quotes. You will notice several names on the screen. These are the "modules" that are currently in memory when "mdir" was run. Notice that "mdir" is there also. It is not there now, because after the command finished, it evaporated. All of OS-9 is like that. Everything is made up of the modules that are loaded into memory and when run, then evaporate. That is, unless you lock it into memory by either *loading* it or *linking* it while it is running. Look at the *load* and *link* commands.

Back to our problem. The boot file on the disk in drive 0 (/d0) has the modules in it that are booted whenever OS-9 starts up. This boot file can be created by you, so that OS-9 will have just what you need to run. All you need to know is how to do this customizing procedure. To verify, type this command:

```
ident /d0/OS9Boot -s
```

Lo and behold, there are the modules that are in memory . . . or are there? Notice that the first four modules are missing, they are OS9 OS9P2 INIT and BOOT. These modules are on the disk somewhere else. These modules are put on the disk where the DOS command in Disk BASIC can get to them. They are loaded in first and then the rest of the system is loaded from the file "OS9Boot." They are put on the disk by the program "os9gen" so you don't have to worry about them.

Now look at the remaining modules (type mdir again), in memory. If you create a file with these modules and use that file when you "os9gen" a new disk, you will have created your own custom boot. Try this: save all the modules except the first four and mdir into a file called "boot," like this:

```
save boot module1 ...... n
```

where "module1" etc., is the names of the modules. Then format a new disk in drive 1 (/d1). Now "os9gen /d1" and when the computer is waiting type: "/d0/boot" then a return. You have now created your very own OS-9. Try doing this without 'D2' and 'D3' and you could leave off RS232 and T1 if you don't need them. Finally, dare I say it, you could even leave off the pipe, piper, and pipeman modules if you wish.

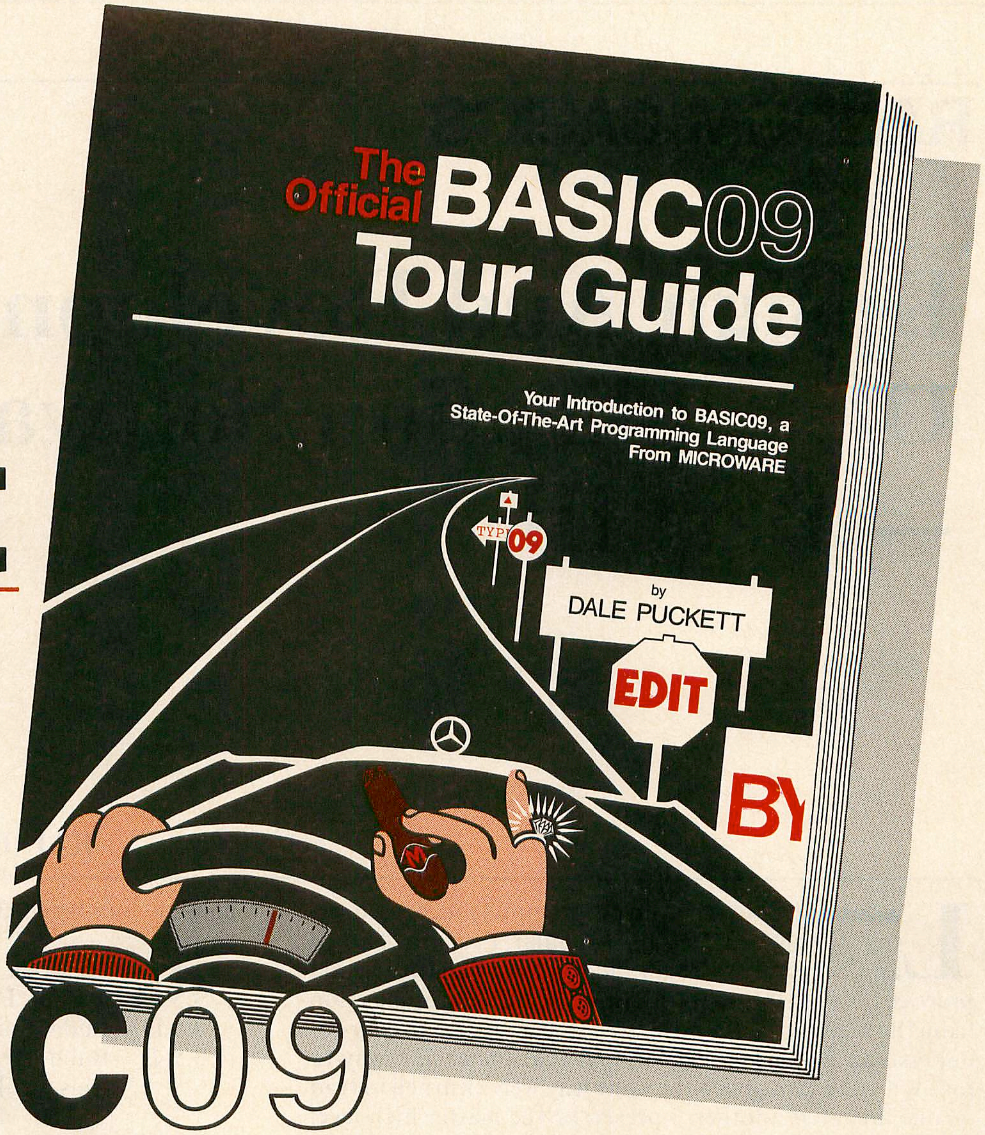
If you are still confused, read the manual describing the commands we talked about and study, study, study.

Late note about Chicago RAINBOWfest: We plan to be there with several of the people who have created the programs you use every day. Rich Hogg, who did the original FLEX on the CoCo and O-Pak will be there, along with Chuck Eaker who created *X-FORTH*, *CC-FORTH* and the new *eFORTH* that we will be displaying for the first time with turtle graphics and music. These two are sold with complete source. This will be your chance to meet some very interesting people, so stop by. I will give another of my now famous off-the-cuff seminars, where even I don't know what it will be about until after it's over.

There were what seemed like 1,000 people at New Brunswick, standing in the doorways and sitting on the floor because there weren't chairs to go around. I was nervous at first until I got to the questions from the floor and then it seemed like just a bunch of guys shooting the bull at a club meeting. So, if you get to Chicago be sure to shoot the bull with me at my seminar. Looking forward to meeting you there.

I want to thank everyone who was so kind to me and my group in New Brunswick. I got to meet hundreds of fine people and make many new friends there. The people in New Jersey are friendly and I enjoyed myself very much. I look forward to going back in September for the Princeton show. Hope to see you there.

# Get the most out of BASIC09


The Official BASIC09 Tour Guide
Your Introduction to BASIC09, a State-Of-The-Art Programming Language From MICROWARE
TYP 09
by DALE PUCKETT
EDIT
BY

The **OFFICIAL BASIC09 TOUR GUIDE** is skillfully written in a friendly and easy-to-read style. Just perfect for those new to computers and to BASIC09. It's also a *valuable reference book* for programmers, engineers, students and hobbyists, providing an in-depth look at BASIC09 plus an overview of the OS-9 operating system. Comprehensive reference sections on BASIC09 and OS-9 commands are also included.

The book "maps" out your route through the Mercedes of Basics . . . BASIC09 and puts you in the driver's seat in no time. Fasten your seatbelt, sit back and enjoy the ride to perfecting your programming skills.

## MICROWARE . . .

The **OFFICIAL BASIC09 TOUR GUIDE** comes from the people who wrote BASIC09. As the leader in 6809 system software, we at MICROWARE care about our users and want to help you get the most from our products.

## It's Easy to Order.

Phone orders are accepted from MasterCard or VISA cardholders or for COD shipment. You can also order by mail using the coupon below. Quantity discounts are available to educational organizations and dealers. For further information contact Microware.

**microware**®

*Specialists in system software for 68-family microprocessors since 1977.*

OS-9 and BASIC09 are trademarks of Microware and Motorola.

MICROWARE SYSTEMS CORPORATION
P.O. Box 4865
Des Moines, IA 50304, U.S.A.
Phone (515) 279-8844
Telex 910-520-2535

Please send ________ copies of the **Basic09 Tour Guide** book at $18.95 each. Add $2.00 for UPS shipping in the U.S. or $5.00 for overseas air mail per book. Iowa residents add 4% sales tax.

Name ____________________

Address ____________________

City ____________________

State ____________ Zip ________

☐ I have enclosed a check

☐ Charge to my bank card:
MasterCard ☐ VISA ☐
Card Number ____________
Expiration ____________

RAINBOWTECH

## RANDOM BASICS

# Design And Development Of Application Software — Part III

**By Paul Searby**
**RAINBOW Contributing Editor**

Last article we touched on programming theory, covering Top Down Design, Modular Program Design and Structured Programming. In summary, a good practice for us to follow is to define our program application from the highest levels down, breaking it into small easy-to-understand parts, keeping in mind that the easiest way to follow a set of thoughts is the same way we've learned to read — one line after another. I presented the master high level flow charts for our example design of an Accounts Payable System, and mentioned that one of the benefits of designing and programming from the top down was that it becomes easier to compensate for oversights in the initial design stage at a later date. Part of this is because by doing the majority of design before programming, you will catch your own oversights (oversight is a nice way to say mistake) at a point where correction is easier.

As I began to work on the file design for this article, I realized that we left a couple of items out of our high level flow charts. We will be referring to these charts throughout the oncoming articles, so you might want to either keep your April issue of THE RAINBOW handy, or make a copy of the charts for future reference. We defined that we would have a keyfile for the Vendor Master, but did not show any references to maintenance of this keyfile. Chart 5 has a column numbered 3.5, which would have the following entries:

3.5 B — Generate New Master Keyfile
3.5 C — Master File data selection (same as 3C)
3.5 D — Build Sort Key in Master sequence
3.5 E — Build Report Control File (same as 3E) (this would use the Keyfile Generation Program in lieu of a report program)
3.5 F — Sort/Merge Program (same as 3F)

When we do the programming, you will see that actually very little code is required to include this option. The other addition to our flow chart is the ability to re-organize the keyfile after additions or vendor name changes. Since this function could go into our chart in a number of places, at this time we will just add it to our Utility Processing activities to insure that we remember it. Therefore, we need to add a box number 3.5 A that says re-organize keyfile to chart 6.

If you are wondering just what is a "keyfile," you are on track! I purposely discussed it prior to defining it, to generate that interest. Virtually every activity that will take place in our Accounts Payable System centers on adding or changing information linked to the Vendor Master File. Since one of our original guidelines was to make the system user friendly, we want to allow the user to access the different vendors *not* by number, but rather by their names. There are three basic ways of allowing that to happen: 1) Search through every vendor record, looking for a match to the requested vendor; 2) Maintain an independent file of the vendor names (and master locations) in sequence and then, with a binary search technique, find the correct vendor quickly; and 3) Develop a random hashing algorithm that allows the program to calculate the vendor location from its name.

*(Paul Searby has been involved with computers and data processing since 1969, working primarily on larger IBM systems until 1975 when he bought, built and programmed the first "personal computer" ever made — an Altair 8800, which came in kit form with 1K of memory. In 1977 he left a position as project manager for a large corporation to devote his full efforts to his company, Computerware.)*

# ACCOUNTS PAYABLE SYSTEM

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RECORD NAME | VENDOR MASTER FILE | | | | | | | | | | | |
| FIELD NAME | VENDOR INDEX | VENDOR NUMBER | STARTING INVOICE POINTER | ENDING INVOICE POINTER | RESERVED | BEGINNING BAL DUE | CURR INVOICED | CURR PAID | YTD PAID | LAST ACTIVITY DATE | VENDOR NAME | VENDOR TITLE / DIVISION |
| CHARACTER POSITION | 1 2 3 4 05 6 | 7 8 9 10 1 2 | 3 4 15 6 7 8 | 9 20 1 2 3 4 | 25 6 7 8 9 30 | 1 2 3 4 35 6 | 7 8 9 40 1 2 | 3 4 45 6 7 8 | 9 50 1 2 3 4 | 55 6 7 8 9 60 | 1 2 3 4 65 6 7 8 9 70 1 2 3 4 75 6 7 8 9 80 1 2 3 4 85 | 6 7 8 9 90 1 2 3 4 95 6 7 8 9 00 |

| | | | | | |
|---|---|---|---|---|---|
| VENDOR TITLE / DIV CONTD . . . | VENDOR ADDRESS | CITY / STATE / ZIP | PHONE AREA CODE | PHONE NUMBER | TERMS PERIOD |
| 1 2 3 4 05 6 7 8 9 10 | 1 2 3 4 15 6 7 8 9 20 1 2 3 4 25 6 7 8 9 30 1 2 3 4 35 | 6 7 8 9 40 1 2 3 4 45 6 7 8 9 50 1 2 3 4 55 6 7 8 9 60 | 1 2 3 4 65 6 | 7 8 9 70 1 2 | 3 4 75 6 7 8 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RECORD NAME | INVOICE SUMMARY FILE | | | | | | | | | | |
| FIELD NAME | VENDOR INDEX | INVOICE NUMBER | NEXT INVOICE DATE | RECEIVED DATE | RECEIVED AMOUNT | LEDGER CODE | REMARKS | PAID DATE | PAID AMOUNT | PAYMENT (CHECK) NUMBER | RESERVED |
| CHARACTER POSITION | 1 2 3 4 05 6 | 7 8 9 10 1 2 | 3 4 15 6 7 8 | 9 20 1 2 3 4 | 25 6 7 8 9 30 | 1 2 3 4 35 6 | 7 8 9 40 1 2 3 4 45 6 7 8 9 50 1 2 3 4 55 6 7 8 9 60 1 | 2 3 4 65 6 7 | 8 9 70 1 2 3 | 4 75 6 7 8 9 | 80 1 2 3 4 85 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RECORD NAME | ACTIVITY FILE | | | | | | | |
| FIELD NAME | VENDOR INDEX | TYPE CODE | T1 = BEG DUE<br>T1-T3 = INVOICE # | T1 = CURR INVOICED<br>T2 = RECD DATE<br>T3 = PAID DATE | T1 = CURR PAID<br>T2 = RECD AMT<br>T3 = PAID AMT | LEDGER CODE | PAYMENT NUMBER | REMARKS |
| CHARACTER POSITION | 1 2 3 4 05 6 | 7 8 9 10 1 2 | 3 4 15 6 7 8 | 9 20 1 2 3 4 | 25 6 7 8 9 30 | 1 2 3 4 35 6 | 7 8 9 40 1 2 | 3 4 45 6 7 8 9 50 1 2 3 4 55 |

| | |
|---|---|
| KEYFILE | |
| RECORD POINTER | RECORD KEY — VENDOR NAME |
| 1 2 3 4 65 6 | 7 8 9 70 1 2 3 4 75 6 7 8 9 80 1 2 3 4 85 6 7 8 9 90 1 |

Obviously, the first method is the simplest, but it is also the slowest. If we didn't plan on having over 10 to 15 vendors, it would be acceptable. However, the Color Computer easily has space for more vendors, and most small companies will have more than 10 to 15 sources that they purchase from. Of options 2 or 3, random hashing is at least as complex as keyfiles and typically takes more space. Therefore (as you could have guessed) we will use a keyfile that is kept in ascending order and has an overflow section for additions and vendor name changes. Since the record size is only 31 characters, we can read it quite quickly and through use of a binary search (more on this later), we will find our target in an average of four or five compares. Keyfile maintenance and use is somewhat involved, but once the technique is developed, it can easily be transported to other programs and applications.

There are three other files included in our Payables System. Before going any further on files, I am going to define some of the terms that will be used whenever we are discussing the information maintained by our programs. First is the term "data," which means information. It is a very general term which could be used to refer to a "file," a "record" or an "element" or "field" within a record. Starting at the lowest level, an "element" or "field" is a single piece of information. Vendor name or vendor balance are examples of an element or field. Next, a record is a collection of elements or fields associated with a particular thing. Thing, in our case, is a vendor whom we purchase from. A vendor record will contain all the fixed information that we want to have on that particular vendor. A file contains all records of the same type. In our Payables System, we have a Vendor Master File, a Vendor Invoice File, an Activity File and the Vendor Keyfile.

Since a RANDOM record must be fixed in length, and we can't accurately guess how many invoices (purchases) there might be for any vendor, we solve the problem by keeping all invoices together in a separate file. They can link back to the vendor master in which they actually belong, allowing many invoices from many vendors to be "pooled" in a common file. This concept really saves a lot of disk storage space because now we only have to allocate space based on the average number of invoices per master, rather than the worst case for all masters, which we would have had to do if the invoices had been included with the master record. The logic for maintaining the master/invoice linkages and invoice file free space is non-trivial, but again, once it is developed, it becomes just another "Black Box Module" that we can re-use in other programs and applications.

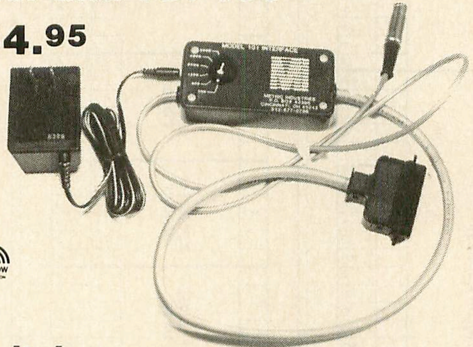
Both the Vendor Master and Activity Files are nice simple files that do not require complex maintenance logic. In fact, in New Period Processing, you will notice that to clear the Activity File, we simply delete the existing one and re-allocate a new one for the next period. The activity file provides several purposes, all relating to our requirement of accountability. As you should have noticed in our charts, whenever significant activity (payments, adjustments, etc.) took place in the system, an activity record was generated. This provides us with not only a comprehensive audit trail, but also with information that can provide reports which

**Metric Industries**

**For the color computer and TDP100**

**Model 101 Interface $54.95**

- Serial to Parallel Interface
- Works with any Centronics Compatible Printer including Radio Shack, TDP, Gemini, Epson, Gorillia and many others
- Six switch selectable baud rates (300 to 9600)
- 90 day warranty
- Power Supply included

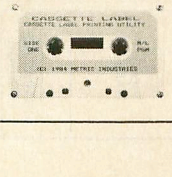


**Model 102 RS-232-C Switcher $35.95**

- Switches all three data lines
- Indicator lights let you know computer is on
- 3 position switch has silver plated contacts for high reliability
- Color coded lights indicate switch position
- Color coded labels for your printer, modem etc., supplied

**Cassette Label Program $6.95**

- Prints five lines of information on pin-feed cassette labels
- Menu driven — easy to use



- Uses special features of your printer for standard, expanded and condensed characters
- 24 free labels included with program
- Auto centering features for each line of text
- 16K ECB required

**General Items**

- Gemini 10X Printer **$319.00**
- Special Save — Printer & Interface **$360.00**
- C-10 Cassettes **$7.50/dozen**
- Hard plastic boxes **$2.50/dozen**
- Pin-feed Cassette labels **$3.00 per 100**
- Free shipping on all orders over $50.00
- Add $3.00 for shipping on orders under $50.00
- Ohio residents add 5.5% sales tax
- Phone order line for VISA and MASTERCARD, orders accepted 24 hrs. a day, call **513-677-0796** or send check or money order to:

**Metric Industries**
**Department R**
**P.O. Box 42396**
**Cincinnati, OH 45242**

**Dealer Inquiries Invited**

will assist in balancing, or which could allow interactive posting to another system such as General Ledger.

Okay, so now that we have defined our file structures, just what are we going to put into these files? To answer that, we must pull back out of the trees and take an overall look at what we are trying to accomplish. Just what does an Accounts Payable System do? Accounts Payable should allow you to enter information from bills you receive, then track them as to due date, give you projections of your cash requirements, tell you when to pay the bills and also provide additional information such as year-to-date purchases, etc.

Starting with the more fundamental information, we will need the vendor's name, address, phone number, and what terms that vendor offers (i.e., net 10). Continuing with vendor information, we will need to keep track of year-to-date payments, current invoices (bills) received, current payments made, the remaining balance due the vendor, and it might be helpful to know when the last activity to the vendor's account was made. Since we have defined the Invoice File as being a separate file that is linked to the master, we will need to provide space in our Vendor Master for pointers to the Invoice File. Lastly, the user may want to assign a number to the vendor, and internally, our programs will be assigning a number to the vendor, so we should allow space for these vendor number index assignments.

Have you ever started out on a trip and traveled some distance from home, only to then remember what you forgot to pack? Well that same feeling prevails about now with our Vendor Master File. If I knew what I've forgotten to include, I wouldn't have forgotten it!

At any rate, since we are using Computerware's Random BASIC™, to program our application, we get somewhat of an advantage in that it is very easy to add additional fields to a random record. Since Random BASIC only reads as little or as much of a record as you tell it to, we can, if need be, later add to the record and only change the programs that will access the new data. This is still going to require a conversion of any existing old files into the new format, so to minimize possible future problems, we will hedge our bets and include one spare numeric field in the Vendor Master Record. There have been more than one occasion that an extra field made satisfying an unusual customer request a "no problem" situation as opposed to major modifications.

Next, we need to consider what information should be retained for each Invoice Record. The basic information should include the invoice number, the date received, the invoice amount, the date paid and the amount paid. Additional information that will help provide more flexible reports and possible interfacing with other accounting systems would be the expense code assigned to the invoice, the check number used when paying the bill and a general purpose remarks field for the user to comment on the invoice. Not forgetting our system's needs, we must include both linkage back to the Vendor Master Record and forward to the next invoice (if any) for the same vendor. Again, we may want to include a spare numeric field for insurance. I have chosen numeric fields as spares because in Random BASIC, even though the precision on numerics is nine digits (can be higher), any numeric is automatically packed into six bytes. This is a small enough amount that almost any record can afford the luxury of a spare field.

As we observed earlier, Activity Records can be produced from various places within the system. Adjustments to either the Vendor Master Record or an Invoice Record generates an Activity Record, as also does making payments. Since the information requirements for each of these activities is somewhat different, we need to either define a rather large record, or reuse certain fields within the same record. Since disk space on the Color Computer does carry somewhat of a premium, we can now take this opportunity to conserve and in fact regain some of the space we wanted for spares in the other files. Thus our Activity Record can use a "type code" to direct the report program as to what the different fields mean for each type of activity. This reduces our requirements down to needing five additional numeric fields plus a remarks field for our Activity Record. As always, the system will require a vendor index pointer so that it can get back to the master for additional report data. Study the enclosed record layout to see how we will use the different activity fields.

Our last file is the Vendor Master Keyfile. It is composed of the vendor index pointer and the vendor name. As mentioned before, its purpose in life is to provide easy user access to the vendors in our Accounts Payable System.

Enclosed with this article are examples of how our files could be defined. The position of the data within the record is not too important, except that as mentioned before, Random BASIC can read only part of a record if desired. Placing often accessed fields at the front of the record could save some time if taken advantage of in our programs. We will not get to the reports until next article. At that time, we will be through our high level design, and will start looking at how our different program modules should be developed and the order in which we will do them.

**Marshmallows for your CoCo**

| | | |
|---|---|---|
| **ED** | THE SUPERIOR PROGRAMMER'S EDITOR<br>for OS-9 or FLEX<br>A combination screen/line editor which addresses specific lines by line number. | $49 |
| **ASM** | 6809 STANDARD MACRO ASSEMBLER<br>for OS-9 or FLEX | $49 |
| **OSM** | 6809 EXTENDED MACRO ASSEMBLER<br>for OS-9 or FLEX | $99 |
| **CRASMB** | 8 BIT MACRO CROSS ASSEMBLER<br>for OS-9 or FLEX<br>Cross assembles these CPU types:<br>6800-2-8 6801-3 6804 6805<br>6809 6811 6502 1802<br>8048 8080-5 Z-8 Z-80 | $399 |
| **CRASMB 16.32** | 16 and/or 32 BIT CROSS ASSEMBLER<br>for OS-9 or FLEX<br>Exclusively supports the 68,000 CPU. | $249 |
| **DO** | SHELL COMMAND LANGUAGE<br>for OS-9<br>Intended to be used for batch processing. Similar appearance to BASIC, with nine string and 26 number variables for parameter passing. | $69 |
| **K-BASIC** | BASIC LANGUAGE COMPILER . . . . . . LEVEL 1<br>for OS-9 or FLEX (Available 1/84)<br>A BASIC to Machine Language compiler. Level 1 supports sequential files, floating point, three sizes of integers, string variables, and arrays. Includes 6809 run time package and OSM assembler. | $199 |

*....PLEASE SPECIFY OS-9 OR FLEX, AND INDICATE DISK SIZE....*

**LLOYD I/O**
19535 NE GLISAN
PORTLAND, OR 97230 **(503) 666-1097**

**SATURN** Electronics Company Inc.

# THE INTRONICS EPROM PROGRAMMER

*Price: $140.*

## *Newly Designed Unit*

## NEW VERSION 2.4

- ☐ Plugs into ROM pack port.
- ☐ Now programs 8K X 8 EPROM *in 15 Seconds.*
- ☐ On board firmware included.
- ☐ No personality modules required.
- ☐ Will program most EPROM's.
- ☐ High quality zero insertion force EPROM socket.

**Enclosed in Molded Plastic Case**

---

**SATURN** Electronics Company Inc.

## SPLC-1 Lower Case

FOR THE COLOR COMPUTER & TDP-100

*FULLY ASSEMBLED, TESTED & GUARANTEED FOR 90 DAYS* **$59.95**

☐ TRUE LOWER CASE CHARACTERS ☐ NO CUTTING OR SOLDERING ☐ FULLY COMPATIBLE WITH ALL TRS-80C (SPECIFY REVISION BOARD) [NOT COMPATIBLE WITH COCO 2] ☐ INVERTED VIDEO AT A FLIP OF A SWITCH

---

YOUR SOURCE FOR THE

## COLOR COMPUTER

| | |
|---|---|
| *DRIVE 0 FOR COCO | $310 |
| *DRIVE 1 FOR COCO | $219 |

**GUARANTEED FOR ONE FULL YEAR*

| | |
|---|---|
| • DISK CONTROLLER FOR COCO | $139 |
| • SATURN RS-232 PORT EXPANDER | $ 30 |
| • POWER-ON L.E.D. KIT | $ 6 |
| • FRONT RESET SWITCH KIT | $ 7 |
| • LIBRARY CASE *HOLDS 70 DISKS* | $ 23 |
| • NEW MULTI-COLOR RAINBOW DISKS | $ 25 |
| • ELEPHANT DISKS SSDD | $ 23 |
| • 8 PRIME 64K RAM-CHIPS | $ 50 |
| • GEMINI 10X PRINTER | $299 |
| • HAYES SMART MODEM 300 | $199 |
| ***F-A-S-T- UPGRADE SERVICES*** | ***$CALL!*** |

## NEW SOFTWARE

## OS·9BBS ............ $89.95

☐ MULTI-USER CAPACITY ☐ FASTER THAN MOST BBS's ☐ MULTI-TASKING (NO LONGER COMPLETELY TIES UP YOUR COCO) ☐ REQUIRES OS·9 AND BASIC 09

## OS·9 40-Track Program ........... $24.95

☐ NOW OPERATE 35/40/80 DOUBLE SIDE, DOUBLE DENSITY DRIVES UNDER OS·9

## 64K Terminal Package ............ $24.95

☐ AFFORDABLE ☐ REQUIRES 64K MEMORY ☐ GIVES YOU 52-58K BUFFER ☐ WRITES TO DISC ☐ READS IN FROM DISC ☐ STANDARD DISPLAY

MasterCard

VISA

(Dealer Inquiries Invited)

- MINIMUM $2.00 SHIPPING & HANDLING.
- NYS RESIDENTS ADD SALES TAX.
- ALL OTHER ORDERS ADD 4% SHIPPING.

**SATURN** Electronics Company Inc.

see us at RAINBOWfest CHICAGO

62 COMMERCE DRIVE
FARMINGDALE, NY 11735
(516) 249·3388

* OS-9 IS A REGISTERED TRADEMARK OF MICROWARE SYSTEMS CORP.

RAINBOWTECH

## KISSABLE OS-9

# A Mix Of Kits, Tricks And Comments

**By Dale L. Puckett**
**RAINBOW Contributing Editor**

I don't believe it's June already! It seems like only yesterday we started writing this column. Yet, the pace gets more hectic each day.

We get so many letters that it is impossible to answer them. Please keep them coming. Your letters keep us on track because they ask the questions you need answered and we need them when we sit down to design each month's column.

This month will be another potpourri and we'll try to answer a lot more questions and clear up some more of the mystery that surrounds this powerful operating system we call OS-9. We'll compare the filters you receive when you purchase the three toolboxes that have been released for CoCo OS-9, and we'll take a look at OS-9's "attr" utility.

### Some Good News From Microware

Jeanne Kaplan at Microware called last week about the Third Annual OS-9 Seminar, scheduled for Aug. 17-20 at the Marriott Hotel in Des Moines. If you like OS-9, you'll love this seminar.

Among the crowd, you'll find people there representing the more than 60 computer manufacturers that use OS-9 as the operating system on their computers. And, you'll find out the latest about new products for both the 6809 and 68000 microprocessors.

Ken Kaplan will join Microware's programmers to answer your questions in round-table discussions about each Microware product during two full days of technical sessions. This year for the first time, Microware will present sessions for OS-9 beginners and advanced users concurrently.

The real fun takes place between sessions when the exhibit hall is open. Here you'll find the leading suppliers of OS-9 software and hardware. Talk about a wish list!

Microware has donated a booth to the OS-9 Users Group and we'll be on hand to answer your questions. And, to give you a little more incentive to visit, we'll hold a drawing at the brunch Sunday and give you a chance to win a selection of hardware and software. We'll have more details for you in the next several months.

### Communications Program Available

Jeanne gave us some more news that should make CoCo OS-9 users real happy. Microware plans to support CoCo OS-9 users with some of their packages soon. One of the first products available will be a communications program for OS-9 — a product that's been almost impossible to buy for the CoCo.

Microware had just started shipping *NineComm* for Standard OS-9 systems when Jeanne called (Mar. 22). I understand that it will allow you to upload and download files using CompuServe's protocol in addition to acting like an intelligent terminal. Microware didn't have their CoCo production equipment online yet, but hoped to have it in the very near future. Contact Jeanne, 515-279-8844, P. O. Box 4865, Des Moines, Iowa, 50304 for information about CoCo software and the annual seminar.

*(Dale L. Puckett is a free-lance writer and programmer who has worked with the Motorola family of microprocessors since 1976. He just completed his first book,* The Official BASIC09 Tour Guide, *this summer. It is being published by Microware and will be available this fall. He is the author of* DynaSpell, Readtest, Esther *and* Help, *which are available from Frank Hogg Laboratories. He serves on the Info World Software Review Board and is a Chief Warrant Officer in the U.S. Coast Guard.)*

### And Good News From The Users Group

We now have more than 250 members in the National OS-9 Users Group and things are finally starting to move. Frank Hogg started shipping *Volume Zero* from our Software Exchange Library this week. We hope that all of you who have joined our group found it worth the wait. As luck would have it, just when we got the master disk to FHL, their suppliers back-ordered their 5¼-inch disks.

Each person who joins the OS-9 Users Group will receive *Volume Zero*. Additionally, Dave Kaleita, our Software Exchange Committee chairman, has just finished *Volumes One* through *Four*. *Volume One* features word processing software. You'll find a spelling checker and a dictionary lookup program plus 10 to 12 additional text-handling utilities.

*Volume Two* will be the compressed 80,000 word dictionary file used by the spelling checker and dictionary lookup programs. There's a catch with this volume though. You'll need to be using 40-track, double-sided, double-density drives to read this disk. The compression routine Eric Williams used is very efficient and reduces the dictionary to about 25 percent of its original length, but let's face it, 80,000 words add up to a lot of characters.

*Volume Three* contains games and several demonstration programs. You'll find both *Adventure* and *Othello* on this disk as well as several benchmark programs. And finally, *Volume Four* contains general purpose OS-9 utility programs designed to make your life easier.

Dave Kaleita has done a tremendous job with the software library for us this year. Unfortunately, next year he will be going back to school to study for an M.B.A. and won't have any time for this task. If you would like to really get involved in the Users Group and help build *Volumes Five* and above, please contact me as soon as possible. Even if you don't have time to manage the library, if you have a favorite utility program or BASIC09 procedure you're proud of, send it to the Users Group. We need it. Here's the address:

Software Exchange Committee
OS-9 Users Group
P. O. Box 8027
Des Moines, IA 50301

The Users Group officers still hope to help the leaders of local Color Computer clubs coordinate OS-9 activity. If you want to help or have any ideas, write me at the address above or leave a note for me on the CompuServe OS-9 SIG. My User I.D. is 71446,736. Just type *GO PCS-18* from the main menu to get to the SIG.

And finally, here's some good news we heard from a Users Group member on the SIG. In the *CMDS* directory shipped with Microware's new C compiler from Tandy is a new version of the *DIR* utility. This one is formatted at 64 columns and looks much better on a printer than the original CoCo OS-9 version which truncated the extended directory listing at 32 characters.

### OS-9 Kudos

We received a nice letter from Dick Dundon, editor of *Dundon's 68XX(X) Newsletter* in Kent, Wash. He had many nice things to say about OS-9 and volunteered to do a column in our Users Group newsletter. We thought we should share a few of his comments here.

> During the last few meetings of the MUG, I have been questioned about which disk operating system to use for the Color Computer, FLEX or OS-9. For most CoCo users, it is a difficult choice based on the information available from advertising and magazine reviews. I have always felt that if you want real time answers, ask the man who owns one.
>
> I have run Smoke Signal DOS on a 6800 system. I have also run FLEX and OS-9 on a 2 Mhz Chieftan system. Based on this experience, I would have to say that the best operating system using a 6809 microprocessor would be OS-9. Yes, I know there have been reviews that say that OS-9 is too complicated, but I don't agree. Let me rebut with a hypothetical example.
>
> How many of you would buy a 1965 model car when you could get a 1984 for the same or less money and have a better machine in the bargain?
>
> In essence, when you buy OS-9, you are getting the latest in disk operating systems and at a price which is very, very competitive with any of the other disk operating systems, including FLEX. OS-9 should win your approval, hands down! The quality of the software immediately available on OS-9 and the versatility of this operating system make it much superior to the older systems.

### Check Out This Benchmark

I received a letter in December questioning BASIC09's speed. This caused me to notice an article with several benchmark programs when I was looking through one of my old magazines last week. I decided to try one of them with BASIC09.

I picked the infamous *Benchmark Program 7* written by Tom Rugg and Phil Feldman and published in *Kilobaud* in June 1977. This is the program that took 204.5 seconds to execute on Southwest Technical Products 8K BASIC. Incidentally, the fastest BASIC, running at two megahertz on an OSI Challenger, executed this benchmark in 21.6 seconds.

**Procedure Benchmark**

```
0000        DIM a,l,k:INTEGER
000F        DIM m(5):INTEGER
001B        PRINT "start"
0024        SHELL "date,t"
002E        k=0
0035  10    k=k+1
0043        a=k/2*3+4-5
0057        GOSUB 20
005B        FOR l=1 TO 5
006B          m(l)=a
0077        NEXT l
0082        IF k<1000 THEN 10
0092        SHELL "date,t"
009C        END
009E  20    RETURN
```

BASIC09, running at two megahertz on my GIMIX finished the program in four seconds. It only took eight

# Sleuthing for Solutions?

**PROBLEM:** Disappointed with only a 32 x 16 screen and only upper case characters for your OS-9 operating system?

**SOLUTION:** **O-Pak** will give you a 52 x 24 HiRes screen with upper and lower case, character set editor, and utilities to copy from RS format to FLEX or OS-9 formats, all for only
**$34.95**

FREE!
Subcribe to
"SOFTNEWS"
a new 48 page
news letter.
Write or call
today!

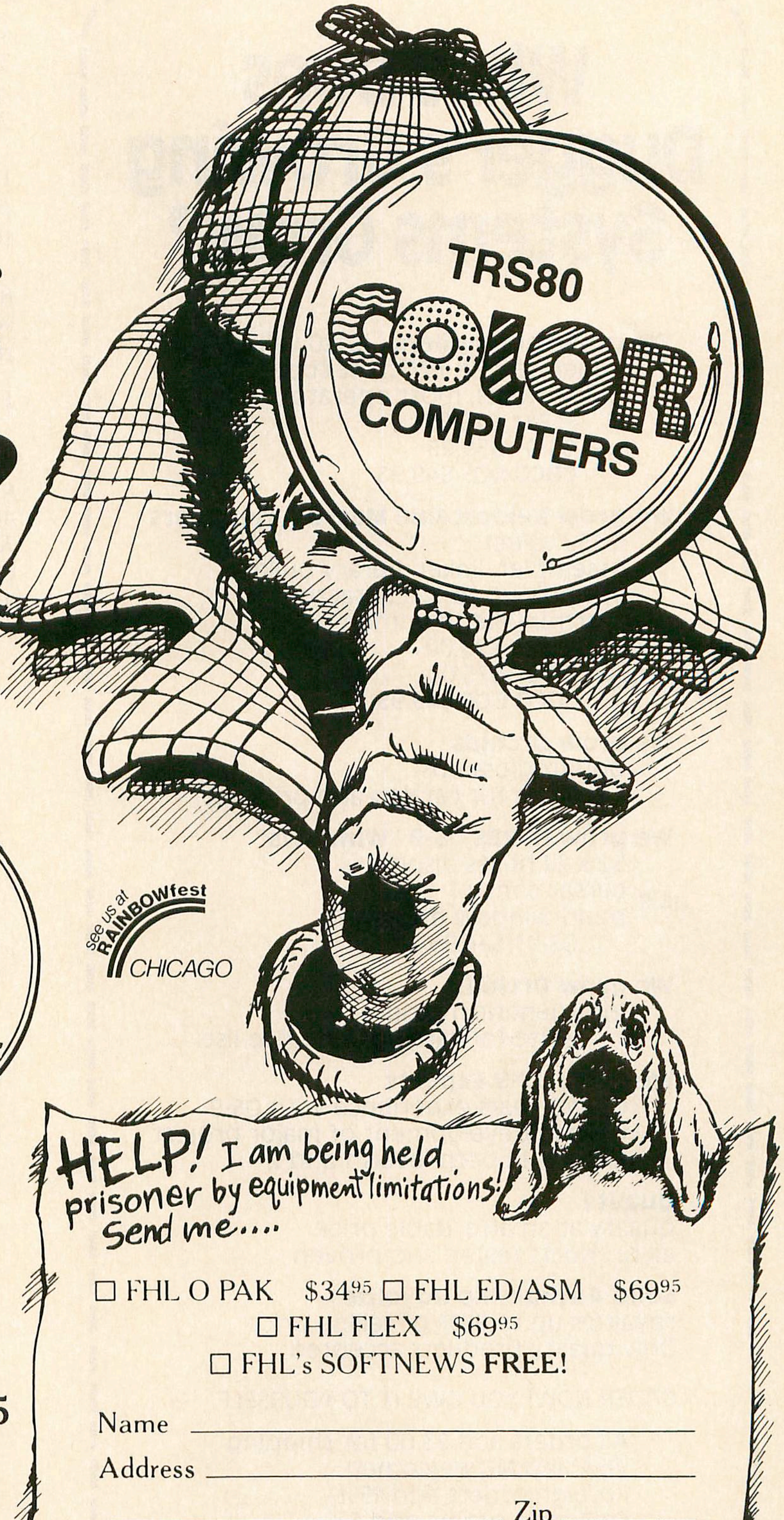
**PROBLEM:** Less than thrilled with the editor/assembler included with your DOS?

**SOLUTION:** **ED/ASM**, a screen type editor and macro assembler will give you all you need for serious program writing for only
**$69.95**

**PROBLEM:** Need an easy to use and understand operating system that makes full use of the 64K in your Color Computer?

**SOLUTION:** **FHL Color FLEX** powerful, easy to use. More low cost software available for it than any other operating system for the Color Computer. Complete with Hi-Res for Only **$69.95**

see us at RAINBOWfest CHICAGO



HELP! I am being held prisoner by equipment limitations! Send me....

☐ FHL O PAK $34.95 ☐ FHL ED/ASM $69.95
☐ FHL FLEX $69.95
☐ FHL's SOFTNEWS **FREE!**

Name ______________________

Address ______________________

______________________ Zip ______

Prices subject to change without notice.

HURRY!

**FHL FRANK HOGG LABORATORY**

THE REGENCY TOWER • SUITE 215 • 770 JAMES ST. • SYRACUSE, NY 13203
PHONE (315) 474-7856 • TELEX 646740

What Does Dugger's Growing Systems Grow?

**We grow C Compilers** ($120 value)
generate fast, efficient code
longs, floats, most operators
FLEX* $75.00
new OS-9* $59.95
COCO DOS $49.95

**We grow Relocatable Macro Assemblers**
($150 value)
Assembler, linker, library builder
symbols up to 32 characters
"fortran-like" common
FLEX* $75.00
new OS-9* $75.00
COCO DOS $49.95

**We grow Orchids**
Odontoglossums
write for catalog and price list

**We grow HI RES OS-9 "Windows"**
52 x 24 hi-res display
new cursor control
multi-window displaying
OS-9* $34.95

**We grow Orchids**
intergeneric hybrids
write for catalog and price list

**We grow OS-9 Experts**
Over 6 years experience with OS-9
Used in development of major project
Experts in both levels 1 and 2

**Quality**
quality at an affordable price
all products tested and proven

**Solid Authorship Royalties**
royalties up to 20% of selling price
Only quality products accepted

ORDER NOW! YOU OWE IT TO YOURSELF

All orders add $3.00 for shipping
VISA and MC welcomed
Foreign orders add 15%
California orders add 6%

For more information write or call:
DUGGER'S GROWING SYSTEMS
Post Office Box 305
Solana Beach, Calif. 92075
**(619) 755-4373**
Technical information 6 am to 8 am PDT only
Dealer inquiries welcome

*Flex—trademark of TSC, OS-9 trademark of Microware

seconds on my CoCo running BASIC09. By comparison, TSC's *XBASIC*, long billed as the fastest BASIC interpreter on an eight-bit microprocessor, executed the benchmark in 24 seconds.

Since I defined all the variables in the BASIC09 program as INTEGERs, I decided to play fair and rewrote the *XBASIC* program to use integers. After I did this, it took 12 seconds to run. BASIC09 still ran three times faster.

I decided to make one more comparison and rewrote the BASIC09 program with *real* variables. It executed in nine seconds, still more than twice as fast as in *XBASIC* using real variables as loop counters. 'Nuff said?

### Filters, Filters And More Filters

In one of the first few columns we introduced you to Microware's *OS-9 File Handler Tool Box* and the concept of filters. Now, two other companies have introduced three additional tool kits. This month, we'll look at the *Hacker's Kit #1* and *Filter Kit #1* from D.P. Johnson in Portland, Ore., and *UTILIX* from FHL in Syracuse, N.Y. First, here's what they contain:

*Filter Kit #1*

| NAME | FUNCTION |
|---|---|
| LS | lists filenames, one per line |
| BUF | buffers input until EOF, then outputs it |
| CP | copies files from working directory |
| DL | deletes a list of files from current directory |
| FLIST | lists files to standard output |
| INFO | displays owner, creation date, attributes of a file |
| MV | moves files from directory to directory without copying |
| PAG | formats data into pages |
| REMOVE | removes a file from data directory without deleting |
| SELL | changes owner number of named files |
| SETAT | resets file attributes of list of files |
| SORT | sorts list of up to 300 names |
| | *Hacker Kit #1* |
| DISINP | disassembles code from standard input |
| FILTER | strips all occurrences of a character from standard input |
| MEMLIST | lists memory in unformatted binary |
| MEMLOAD | loads files into memory at absolute address |
| REWRITE | writes standard input into a file at specific offset |
| SPLIT | splits data from input file into one or more output files |
| | *UTILIX* |
| CAT | concatenates text files and lists to standard output |
| CODE | prints decimal and Hex values of character typed |
| CRYPT | encrypts files |
| DIFF | compares two files, line by line and reports differences |

| | |
|---|---|
| DISPLAY | displays the ASCII, decimal, Hex or octal value typed |
| GREP | searches file for expression |
| LOWER/ UPPER | converts all characters to lower or uppercase |
| PACK/ UNPACK | compresses and decompresses text files |
| PR | lists and formats files to standard output |
| SORT | sorts a file with up to 10 keys |
| TAIL | prints the last part of a file |
| TIME | times the execution of a command |
| WC | counts characters, lines and words |

*Microware Tool Kit*

| | |
|---|---|
| CODE | prints Hex value of character typed |
| COMPRESS | compresses files |
| COUNT | counts characters, lines or words |
| D | prints directory list, with ability to match filenames |
| EXPAND | expands compressed file |
| GREP | searches a file for a pattern |
| PR | lists formatted files to standard output |
| QSORT | sorts data in memory quickly |
| SPACE | reads a file and inserts spaces or indents output |
| SPLIT | splits large file into several smaller files |
| TR | transliterates characters into another |
| XMODE | displays or changes intialization of device descriptors |

### First, Johnson's *Filter Kit*

Let's look at D.P. Johnson's tool kits first. These commands use only the standard input and output paths for I/O. This means their input and output can be redirected to various devices or files, or piped to another process. Utilities like these are meant to be used together.

For example, *LS* lists filenames in the current data directory. At the same time other commands in the tool kit perform an operation on a list of files. *DL* deletes all files named, *PAG* paginates data before it is listed to your screen or printer and *SORT* sorts any data it receives from the standard input path. Consider these command lines:

```
OS9: ls
OS9: ls ! dl
OS9: ls ! pag
OS9: ls ! sort ! pag
```

The first command simply lists your current data directory, one filename per line. The second will delete all files in your current data directory. The third will print a paginated list of files in your current data directory. And, the last will print a sorted and paginated list of files in that directory.

Usually you wouldn't want to delete all the files in a directory. But, suppose for a minute that you want to delete all files that begin with the letter 'a'. To do this, you would

YORK 10™ CASSETTES

COMPUTER GRADE
DATA TRAC
BLANK CASSETTES

C-05, C-06, C-10, C-12, C-20, C-24, C-32

From the leading supplier of Computer Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.

BASF-LHD (DPS) world standard tape.
Premium 5 screw shell with leader.

Internationally acclaimed.
Thousands of repeat users.

Error Free • Money back guarantee.

✱ 500 C-12's or C-10's — 38¢ each
(w/labels, add 4¢ • Shipping $17./500
500 Boxes 13¢ ea. • Shipping $10./500
(Free Caddy offer does not apply)

NEW
TRACTOR FEED • DIE-CUT
BLANK CASSETTE LABELS
WHITE: $3.00/100 $20.00/1000
COLORED LABELS • Pastels - Red, Blue, Green, Yellow, Lavender
$4.00/100 $30.00/1000

CASSETTE STORAGE CADDY
Holds 12 cassettes w/o boxes
Includes edge labels and index card
$2.95

FREE
1 CADDY WITH EVERY 4 DOZ. CASSETTES PURCHASED
(does not apply to 500 quantity offer)

VISA Call: 213/700-0330 for IMMEDIATE SHIPMENT on Credit Card Orders MasterCard

ORDER NOW... MAIL TO... YORK 10™
9525 Vassar Ave. #R1
Chatsworth, CA 91311

ORDER FORM

| ITEM | 1 DOZEN | 2 DOZEN | TOTAL |
|---|---|---|---|
| C-05 | ☐ 7.00 | ☐ 13.00 | |
| C-06 | ☐ 7.00 | ☐ 13.00 | |
| C-10 | ☐ 7.50 | ☐ 14.00 | |
| C-12 | ☐ 7.50 | ☐ 14.00 | |
| C-20 | ☐ 8.75 | ☐ 16.50 | |
| C-24 | ☐ 9.00 | ☐ 17.00 | |
| C-32 | ☐ 11.00 | ☐ 21.00 | |
| Hard Box | ☐ 2.50 | ☐ 4.00 | |
| White Labels | ☐ 3.00/100 | ☐ 20.00/1000 | |
| Colored Labels Color____ | ☐ 4.00/100 | ☐ 30.00/1000 | |
| DESCRIPTION | PRICE | QUANTITY | |
| Storage Caddy | 2.95 | | |
| | | | |
| | | SUB TOTAL | |
| Calif. residents add sales tax | | | |
| Shipping/handling (any quantity — using prices above) | | | 3.50 |
| Outside 48 Continental States — Additional $1 per caddy; per doz. cassettes or boxes. | | | |
| | | TOTAL | |

#R1
Each cassette includes two YORK 10 labels only. Boxes are sold separately. We prefer to snip by UPS as being the fastest and safest. If you need shipment by Parcel Post, check here ☐.

NOTE: Additional charges outside 48 Continental States. Shipments to AK, HI, and USA possessions go by Priority Mail. Canada & Mexico—Airmail, All others— Sea Mail.

Ask about our DUPLICATING SERVICE

CHECK OR M.O. ENCLOSED ☐ Charge to Credit Card: VISA ☐ MASTERCARD ☐
☐ PLEASE SEND QUANTITY DISCOUNTS

Card No. ____ Exp. ____
Name ____
Address ____
City ____ State/Zip ____
Signature ____ Phone ____
Computer make & model ____ Disk? (y/n) ____

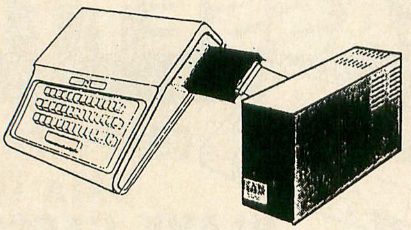
**MICRO R.G.S. INC.**
751, Carre Victoria, Suite 405, Montreal, Quebec, Canada, H2Y 2J3

**computer mail order**

## DISK DRIVES for the CoCo

TEAC & TANDON DISK DRIVES

*40 track - 6 ms trk-trk*
*FULLY COMPATIBLE*



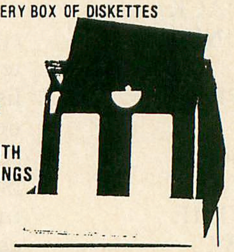
drive Ø $339.00

drive 1 $199.00

## SPECIAL

## DISKETTES

FREE PLASTIC LIBRARY CASE INCLUDED WITH THE PURCHASE OF EVERY BOX OF DISKETTES



**5″ DISKETTES!**
SOFT SECTOR
40 TRACK
DOUBLE DENSITY WITH
HUB REINFORCING RINGS
$19.90
*PACKAGE OF 10*

## CoCo HARD DISK DRIVES

5 meg $1295 10 meg $1595

-- COMPLETE ------ JUST PLUG IN -----

HARD DISK-OPERATING SYSTEM features

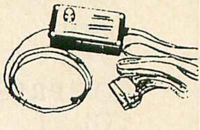
- FULLY INTEGRATED INTO COLOR DISK BASIC
- TAPE TO HARD DISK
- DISK TO HARD DISK
- HARD DISK TO TAPE
- HARD DISK TO DISK
- DUPLICATE
- COLD START
- M-RUN
- ALL EXTENDED BASIC COMANDS

see us at RAINBOWfest CHICAGO

INTERFACE CARD & H-DOS operating system $425⁰⁰

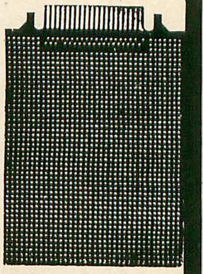
PERIPHERAL H-DOS UTILITY PACK $129⁰⁰
BOOT STRAPS OS-9, FLEX, MDIR (master directory)

## PARALLEL INTERFACE



for the GEMINI printer
300 to 9600 baud
complete with cables
$ 54⁹⁵

## PROJECT BOARDS



GOLD PLATED EDGE CONNECTOR
FOR PERIPHERAL EXPERIMENTS

$ 29⁹⁵

**64K Memory Expansion Kit**
All parts and complete instructions
49⁰⁰

## NOW AVAILABLE!!

OS 9 users.......
128K MEMORY board
MEMORY MAPPED INTO
32K BYTE BLOCKS
including RAM chips
PRICE .. .. ..call ?

## COLOR MODEM 300

direct connect smart modem card
multipak interface compatible
auto answr, auto dial, re-dial, search,
full audio line monitoring
full duplex, 300 baud

$169.⁹⁵

## SOFTWARE

| SOFT LAW | ROM | D |
|---|---|---|
| VIP WRITER | $59.95 | $59.95 |
| VP SPELLER | -- | $49.95 |
| VIP CALC. | $59.95 | $59.95 |
| VIP TERMINAL | $49.95 | $49.95 |
| VIP DATA BASE | -- | $59.95 |
| VIP DISK-ZAP | -- | $49.95 |

| COMPUTERWARE | T | D |
|---|---|---|
| ★JUNIOR'S REVENGE | $28.95 | $31.95 |
| ★TIME PATROL | $24.95 | $29.95 |
| ★HYPER ZONE | $26.95 | $29.95 |
| ★COLOR BASIC COMPILER | -- | $39.95 |
| 64K SCREEN EXPANDER (64K) | $24.95 | $27.95 |
| ·THE SOURCERER | $34.95 | $39.95 |
| ★DISK MACRO ASSEMBLER & XREF | -- | $49.95 |
| ★COLOR EDITOR | $24.95 | $29.95 |
| ★COLOR MONITOR | $24.95 | $27.95 |

| ELITE SOFTWARE | T | D |
|---|---|---|
| ELITE-WORD | $59.95 | $59.95 |
| ELITE-CALC | $59.95 | $59.95 |

| COGNITEC | T | D |
|---|---|---|
| TELEWRITER 64 | $49.95 | $59.95 |

| PRICKLY-PEAR SOFTWARE | T | D |
|---|---|---|
| ADVENTURE IN WONDERLAND | $24.95 | $29.95 |
| THE DISK MANAGER | -- | $29.95 |
| THE DISK MASTER | -- | $24.95 |

**USA**
MICRO R.G.S. INC.
30 CANUSA STREET
BEEBE PLAIN, VERMONT,
05823, USA
US Toll free line 800-361-4970

**CANADA**
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

**CANADA**
**New! TORONTO OFFICE**
**696 Yonge St., #704**
**Tel: (416) 967-1730**
Canadian Toll Free 800-361-5155

use the following command:

```
OS9: ls a* ! dl
```

If you only want to delete files that begin with the letter 'a' and have filenames three characters long, you could type:

```
OS9: ls a?? ! dl
```

Perhaps you want to list only directory files in a directory. This command line should do the job:

```
OS9: ls -A.d.
```

Here, *LS* is checking to see that the directory attribute is on before it lists the filename. *LS* also lets you check for attributes that are off, the owner's number, and the date. There is even an option that lets you list the names of files that were created before a certain date.

Johnson's *CP* utility lets you copy files whose names appear on the standard input path from the current data directory to a file of the same name on the destination path.

```
OS9: chd /d1/SOURCE
OS9: ls -nby83m7 ! cp /d0/SOURCE.BAK
```

These command lines will cause files in the directory /d1/SOURCE to be copied into the directory /d0/SOURCE.BAK if they were not modified before July 1983.

We can't show you all of the details here, but we'll give you a few more examples from Johnson's package to whet your appetite. Using *INFO* is similar to running the standard OS-9 utility, *DIR* with an 'e' option. It displays the owner number, the creation date, modification date and time, attributes, byte count and the name of a file. Here are two forms of its use:

```
OS9: info ls cp dl
OS9: ls -e ! info
```

*MV* is a handy utility because it lets you move a file from one directory to another without actually copying the file. Needless to say, this is much faster. Also the two directories must be on the same physical device.

Suppose you have all the commands you want in a directory, but they are in random order. You would rather have them filed in sorted order. Try this:

```
OS9: makdir /d0/CMDS.SORTED
OS9: chd /d0/cmds
OS9: ls ! sort ! mv -l /d0/cmds.sorted
```

Johnson's *Hacker's Kit* gives the advanced programmer a disassembler and a way to work with data in OS-9's memory area. This disassembler is unique in that it doesn't get its input from a file or from a specified location in memory. Rather, it reads the standard input path. This means there are several ways to disassemble a program.

```
OS9: disinp <code
OS9: list code ! disinp
OS9: memlist A026 55 ! disinp
```

Assuming there is a file named code in the current data directory and that it has been loaded into memory with its execution start at A026 Hex, each of the command lines above will do the same job.

### *UTILIX* — UNIX-Like Tools From FHL

The *UTILIX* package from Frank Hogg Laboratory bring UNIX-like utilities to CoCo OS-9. Most of the tools in this kit use the standard UNIX command names and their command line syntax is for the most part identical to the corresponding UNIX command.

*CAT* for example, lists text files to the standard output path. This doesn't sound like much, but let's see what happens when we apply a little creative thought.

The most obvious use for *CAT* is to combine a number of files into one. To do that you would type a command line like this:

```
OS9: cat file1 file2 file3 >bigfile
```

The redirection operator at the left end of the command line will direct the standard output path into a file named bigfile located in your current working data directory.

Now let's show you a trick with *CAT*. What do you think this command line will do?

```
OS9: cat >workfile
```

Would you believe that this command line emulates the standard OS-9 BUILD utility?

The *CODE* utility is similar to the Microware *CODE* utility, except this one goes one better and prints both the decimal and Hex value of the character you type. Microware's *CODE* program only prints the Hex value of the character.

If you like to keep secrets, you'll find *CRYPT* an interesting program. You supply the secret code word and it ciphers the file which makes it unreadable to humans.

```
OS9: crypt mycode <myfile >secretfile
OS9: crypt mycode <secretfile
```

The first command line will cipher the text in a file named "myfile" located in the current data directory using the code word, "mycode." The second will decipher that file and list the original English languge text on your CoCo screen.

*DIFF* is one of the slickest programs in the *UTILIX* package. It compares two files on a line by line basis. If lines are missing from a file, it tells you which lines are missing and where they should be located. If a file has extra lines, it finds them for you. Or, if the two files have different lines in them, *DIFF* will tell you which lines to replace to eliminate the differences.

The FHL *DISPLAY* utility is similar to the standard OS-9 Display utility, except it is more versatile. The original *DISPLAY* will only display Hex values to the standard output path. This *DISPLAY* will take ASCII text, as well as decimal, hexadecimal and octal input and display the result on your screen or printer. It's sort of like McDonalds, you can have it your way.

The *UTILIX SORT* utility is not limited to data in memory and can therefore sort files that are fairly large. You are limited here only by the amount of disk space you have available for work files.

*TAIL* is very handy and also versatile. It lets you look at the last few bytes, characters or lines of a file. You tell it how many characters or lines you want to see. For example:

```
OS9: tail - 10l myfile
OS9: tail - 10c myfile
```

The first command line will let you see the last 10 lines of "myfile." The second will only let you see the last 10 characters.

*TIME* is a useful program when you are benchmarking a procedure. Want to know how long it takes to list a file? Ask your trusty CoCo to tell you.

```
OS9: time list testfile
```

And finally, *WC* is a handy program that lets you count the number of characters, lines or words in a file. If you don't tell *WC* what you want to count, it will count all three. It is very similar to Microware's *COUNT* utility.

**Microware's *Tool Kit* Has Several Pluses**

Microware's *File Handler Tool Box* is very similar to the *UTILIX* package. It has many of the same utilities. However, three of these tools really shine and thus deserve special mention.

First, I must say that since I purchased these programs at Microware's seminar last August, I almost always use the "D" utility instead of the standard OS-9 *DIR* command. This tool is powerful because of its wildcards.

| | |
|---|---|
| a* | matches ABC, afile, a, arm.c or a.tempfile |
| *a* | matches all the above, file.a, break, or file.bak |
| *a | matches file.a, testa, temp.a or wondra |
| *.bak | matches file1.bak, test.bak, asm.bak, or .bak |

Study the matches above and you'll soon realize the power of this utility. Of course, its output could be piped into Dan Johnson's utilities also.

The two Microware tools that really shine are *GREP* and *TR*. *GREP* is similar to *GREP* in *UTILIX* but more versatile. It is more powerful because it recognizes what Microware calls a set of regular expressions. Included are operators that match any ASCII character, closure, a character class, an EOL character and a special escape symbol. All the standard escape symbols are recognized. They include:

\t = tab character  
\n = new line character  
\b = backspace character  
\f = form feed character

*GREP* and *TR* will both recognize any ASCII numeric value between one and 127 that immediately follows the backslash. For example, \32 will cause *GREP* and *TR* to recognize an ASCII space which is 32 decimal or 20 hexadecimal.

*TR* is an especially useful tool because it gives you a way to go through a file and convert any string of characters to any other string. To get a feel for its power and shorthand, study this command line.

```
OS9: TR [a-z] [A-Z] myfile
OS9: TR [A-Z] [a-z] myfile
```

If you run these two command lines you will see that they are equivalent to the commands *UPPER* and *LOWER* in the FHL *UTILIX*. In the first command line *TR* converts any character between "a" and "z" to the corresponding capital letter. The second command does just the opposite. Of course, since *TR* recognizes the regular expressions we mentioned earlier, it can be used to change just about anything to just about anything else.

Between these three OS-9 tool kits you can do just about anything. You are limited only by your imagination and willingness to experiment. Have fun!

Here is the ordering information in alphabetical order.

*Filter Kit* and *Hacker's Kit*  
D.P. Johnson  
7655 S.W. Cedarcrest Street  
Portland, OR 97223  
(503)-244-8152

*File Handler Tool Box*  
Microware Systems Corporation  
5835 Grand Avenue  
Des Moines, IA 50312  
(515)-279-8844

*UTILIX*  
Frank Hogg Laboratory  
The Regency Tower, Suite 215  
770 James Street  
Syracuse, NY 13203  
(315)-474-7856

**Questions And Answers**

From Virendra Jain in Arlington, Mass.: 1) I cannot assemble and print the full listing on a printer. It only lists the errors. 2) *TMODE-UPC* does not work in the START-UP file. 3) How do I put tabs when writing assembly source files?

The OS-9 assembler is controlled by options you type on the command line. Try this:

```
OS9: asm #20K myfile o l >/p
OS9: asm #20K myfile l o=/d1/mydirectory/myfile.obj
```

1) The 'l' option on the commmand line causes the assembler to list the combined source and object code. The redirection operator, '>' causes the output to go to the printer. The 'o' option causes the assembler to send its output to a file named "myfile" in your current execution directory. This is usually /d0/cmds.

The printing can also be turned on and off within the source code by using the opt statement, i.e., "opt l" or "opt -l." You can also redirect the object file by using the format shown in the second command line above.

2) When you use *TMODE* within a procedure file you must give it enough information to determine which path it is working through. Since you are dealing with standard output, you want to change the descriptor attached to path #1. To do this you would use this command line.

```
OS9: tmode .1 -upc
```

3) The asm will list the combined source and object code with the proper tabbing automatically. You must simply make sure that each line that is supposed to start with a label starts in column one and each line that starts with an operator starts in column two. If you want to make the entire line a remark, you may type an asterisk in column 1. Here's an example subroutine before and after assembly.

```
* A routine to classify a character
* returns with carry set if character
* is not alphanumeric.
class cmpa #'z char is in a-reg
 bhi notasc
 cmpa #'a
 bhs ascii
 cmpa #'Z
```

# FHL eforth

## WHY FORTH?

Why would anyone choose to use FORTH to write programs instead of a better known language such as FORTRAN or PASCAL or even BASIC which probably came free with the computer? FORTH is more than a programming language. It is a programming environment, and it is a programming philosophy.

### THE FORTH ENVIRONMENT

FORTH is a 'modeless' environment. At any given moment, the FORTH disk operating system and its commands are available to you. So are the FORTH editing commands, the FORTH compiler, the FORTH interpreter, and the FORTH assembler. These are not separate programs that you have to "get out of" in order to use one of the others. The resources of each are available to the others at all times.

FORTH is extensible. This means that you can build new commands, new functions, and new data structures out of existing ones. The new ones look and behave like the old ones.

FORTH is interactive. You can create and immediately test new commands, functions, and data structures from the keyboard. In FORTH, your "programs" are written in small pieces called "words" that are combined to make new ones. Any word can be tested from the keyboard. If your testing needs data, you can supply it from the keyboard. If it returns data, you can see what comes back at the keyboard.

## WHY eFORTH

Frank Hogg Laboratory, Inc. announces the release of their new FORTH program called "eFORTH" for Radio Shack DOS or the FLEX operating system. Written by the author of X-FORTH and CC-FORTH, eFORTH conforms closely to the FORTH 1983 standard.

eFORTH includes the following features:

*-Simpler - smaller, more powerful set of words that behave more consistently.
*-Hundreds of definitions provided in source code - both high level FORTH definitions and assembly language definitions.
*-Easy redirection of input and output.
*-Follows the FORTH 1983 standard.
*-Complete FORTH editor*-source code provided.
*-Complete Motorola mnemonic assembler.
*-Follows the version of FORTH described in Leo Brode's Starting Forth book (with a few exceptions as stated in our manual) so the user can use the examples in his book without modification. Contains every word described in Starting Forth.
*-CC FLEX and RS DOS versions are compatible at the disk level. Programs and data can be transferred between the two operating systems with no problem.
*-Extensive and easy to use manual. This 200 page manual is written in an friendly manner with humor that makes it a pleasure to learn FORTH.
*-Low cost. At $79.95 eFORTH is almost half the cost of X-FORTH and $20.00 less than CC-FORTH and it's better.
*-Complete package, nothing more is needed to use it.

eFORTH Only **$79.95**

**NOTICE: CC-FORTH and X-FORTH Owners:** Until May 31st 1984 you may purchase eFORTH at **60%** of retail cost which is $48.00 plus $3.50 S&H. eFORTH is not an upgrade to either of these two languages but a replacement and we felt that you deserved this consideration. To qualify for this discount you must send in proof of purchase in the form of a copy of the invoice. You **must** have this in order to get this special price.

FHL FRANK HOGG LABORATORY
THE REGENCY TOWER • SUITE 215 • 770 JAMES ST. • SYRACUSE, NY 13203
PHONE (315)474-7856 • TELEX 646740

see us at RAINBOWfest CHICAGO

```
    bhi notasc
    cmpa #'A
    bhs ascii
    cmpa #'9
    bhi notasc
    cmpa #'0
    bhs ascii
  notasc orcc #1 set carry
    rts
  ascii andcc #$FE clear carry
    rts
```

```
Microware OS-9 Assembler 2.1 03/28/84 20:50:37 Page 001

 00001           * A routine to classifiy a character
 00002           * returns with carry set if character
 00003           * is not alphanumeric.
 00004  0000 817A  class   cmpa  #'z     char is in a-reg
 00005  0002 2214          bhi   notasc
 00006  0004 8161          cmpa  #'a
 00007  0006 2413          bhs   ascii
 00008  0008 815A          cmpa  #'Z
 00009  000A 220C          bhi   notasc
 00010  000C 8141          cmpa  #'A
 00011  000E 240B          bhs   ascii
 00012  0010 8139          cmpa  #'9
 00013  0012 2204          bhi   notasc
 00014  0014 8130          cmpa  #'0
 00015  0016 2403          bhs   ascii
 00016  0018 1A01  notasc  orcc  #1      set carry
 00017  001A 39            rts
 00018  001B 1CFE  ascii   andcc #$FE    clear carry
 00019  001D 39            rts

 00000 error(s)
 00000 warning(s)
 $001E 00030 program bytes generated
 $0000 00000 data bytes allocated
 $0061 00097 bytes used for symbols
```

From Mitchell Krupp of Salmon Arm, B.C., Canada: I've tried to Cobbler onto a new disk only to find I have *no permission* to copy the *CMDS* directory. Do I have to copy each command separately to a new *CMDS* directory?

You cannot copy a directory with the *COPY* utility. To copy the files in a directory, you must first create a new directory with the *MAKDIR* utility. After you do this you can copy each file individually or use the *DSAVE* command to copy all of them. There are several ways to accomplish this. For example, to copy a single directory, try this:

```
OS9: dsave -s20 /d0/cmds /d1/cmds ! shell
```

If you want to copy an entire disk and let the dsave utility make the directories it needs, you can try these alternative command lines:

```
OS9: dsave -s20 /d0 /d1 ! shell
OS9: dsave -s20 /d0 ! (-x chd /d1)
```

If you want to copy some of the files in a directory to another disk with a directory of the same name, use dsave and your editor. First, run this command:

```
OS9: dsave -s20 /d0/cmds /d1/cmds >/d0/copy_some
_commands
```

Then use your editor and delete the lines in the file "/d0/copy_some_commands" that contain the command lines to copy files you do not want to copy. When you have finished editing the file, use the file as a procedure file. Assuming that "/d0" is the current data directory, you would simply type:

```
OS9: copy_some_commands
```

As a sidelight, you can use *DSAVE* as a quick and dirty hierarchical directory command with a command like this:

```
OS9: dsave -i /d0 /d1
```

Sure, you'll have a few extra items on each line, but it will tell you which directories are on a disk and what's in each directory real quickly.

From Dick Sykes in Costa Mesa, Calif.: Can the output of a BASIC09 process be redirected through OS-9, i.e., from the "outside," to the printer?

The output of a BASIC09 program can be redirected from the OS-9 command line like this:

```
OS9: basic09 yourprogram >/p
OS9: yourprogram >/p
```

The first command line will link to BASIC09 if it is in memory, or load it from your current execution directory and then link to it. Then, it will load the BASIC09 procedure *yourprogram* from your current data directory and execute it. During this run all output to the standard output path from the BASIC09 program will go to your printer, device /p.

Since you didn't redirect the input, it will be taken from the device, /term, usually your CoCo's keyboard when you are not using an external terminal through *TSMON*. Notice also that you did not redirect the error output path, so any error messages or messages usually sent to the error output path will be sent to your CoCo screen through the device, /term.

The second command line above assumes that *yourprogram* is a packed BASIC09 I-code module. If it is in memory, it will link to it and attempt to link to BASIC09's runtime package *RunB*. If *RunB* is not in memory, it must be in your current execution directory. *Yourprogram* must also be in this directory.

If OS-9 finds *RunB* in memory it will run the procedure *yourprogram*. If not, it will load it from the current execution directory and then run your program.

All of this is automatic and seems very magical. Yet, on the bottom line it is up to you to make sure that BASIC09 source code procedures are in the current data directory and that *RunB* and any BASIC09 I-code (packed) procedures are in your current execution directory. If you do not do this, you will be bombarded with an error message. (Error #216 when *RunB* cannot be found in the current execution directory and Error #43 when BASIC09 cannot find the procedure it needs to execute.)

If you want other people reading your source code to be able to tell that you intend to let them redirect the output of your program, use the paths #0, #1 and #2 explicitly in your code. Path #0 is always the standard input path; #1, the standard output path; and #2, the standard error output path. Further, use path #1 for any messages you intend to have redirected, and path #2 for anything you want prompted to your terminal (CoCo's screen).

Jack Bevill of Mountain City, Ga., asked us to give more details about using BASIC09 on a one-drive system.

The first problem most people have had with BASIC09 is

# DYNASTAR/DYNAFORM

SCREEN EDITOR/ WORD PROCESSOR FOR OS9 & FLEX

DynaStar is a powerful, menu-driven screen editor equally suited to the tasks of program preparation and document processing. With the addition of the optional DynaForm print formatter/mail-merge program it is a complete word processing package for your OS9/FLEX system.

DynaStar Version II features no-nonsense "what you see is what you get" editing. To edit, simply move the cursor where you want it, and type. Any printable character you type is entered directly into your text, and any non-printable control character is interpreted as an editing command and is executed immediately. It's that simple! Single keystroke commands move the cursor in any direction, by character, word, tab, line or screenfull, and delete characters, words, or a whole line. Two keystroke commands augment the simple commands by moving the cursor to the left or right margins, top or bottom of the screen, next paragraph, or the top or bottom of the edit buffer. You can search for a string, replace it with another, do it again, mark text blocks, move, copy or delete blocks, write them to side-files, read them in somewhere else, set tabs and margins, and center lines.

DynaStar features automatic word-wrap, and optional right justification right on the screen as you go, so you see how it will look BEFORE you print it. For programmers there is an auto-indent mode to help you write those well-structured programs. DynaStar permits editing of long files without having to break them up, and the OS9 version will even let you go back to the Shell to do almost anything you want (including edit another file) without even losing your place.

DynaStar has an optional help facility that you can turn on or off at will. When on, help menus are displayed at the top of the screen giving you a brief meaning for each command.

DynaStar includes a unique macro facility to let you define more powerful commands by converting any control character to a command/text string of your choice. You can use this feature to completely remap your keyboard if you don't like the way we did it, and you can provide a special "startup string" which is processed every time you enter the editor to customize the editor to your own taste. (Not for RS OS9 version)

For complete word processing, the optional DynaForm text formatter provides all the standard features including pagination, headers and footers, single, double, and multiple spacing, boldface, double-strike, and underline. DynaForm has its own macro facility with string variables, nested include files, FULL MERGE/PRINT facilities, and automatic generation of Index and Table of Contents.

**SPECIAL NOTE TO COLOR COMPUTER OS-9 USERS:**

DynaStar has taken advantage of the special features in O-Pak. This greatly enhances the way DynaStar functions. These features are currently only available for the Color versions of OS-9. You may work with text up to 250 characters wide. DynaStar will scroll sideways so that you may view a window of your text that is the current width of your screen. DynaStar will work with any screen size you desire because it adjusts itself to suit whatever screen is being used. Thus you may enter text with an easy to read screen and then switch to a wider screen to double check the formatting and make final adjustments. O-Paks Hi-Res screen was designed with DynaStar in mind and because of this it runs very fast. We also took advantage of O-Pak and added two extra characters to give you two cursors and a special mark that indicates control characters on the screen. However if you wish to use DynaStar with an external terminal you should buy the standard version of DynaStar as this version will only work with the CoCo screen. But if you are running the terminal at baud rates slower than 4800 baud then you will not be happy with any screen editor and should stay with a line editor such as ED. There is too much screen updating to make using them at slow baud rates pleasant.

**SPECIAL NOTE TO COLOR COMPUTER FLEX USERS:**

Because DynaStar does its formatting on the screen, UNLESS you are using an external terminal the 51 x 24 CoCo FLEX format will limit its usefulness as a general word processor. DynaStar still makes an excellent screen editor for your programming needs and can be teamed up with the TSC text formatter (which formats at print time) to do word processing.

CC FLEX or OS-9 Color Computer versions:

| | |
|---|---|
| ORIG. | **$90.00** |
| DynaStar | **$49.95** |
| DynaForm | **$49.95** |
| Purchased together | **$99.90** |

**RS-OS-9** version requires **O-PAK.**

see us at RAINBOWfest CHICAGO

FHL FRANK HOGG LABORATORY

THE REGENCY TOWER • SUITE 215 • 770 JAMES ST. • SYRACUSE, NY 13203
PHONE (315)474-7856 • TELEX 646740

# STRETCH

$\$29^{95}$ Tape

Add $3 for disk

## RAINBOW SCREEN MACHINE

The Rolls Royce of hi-res text utilities. —more features than all others combined! Adds a whole new dimension to your programs.

- Replace that ugly 32 x 16 screen with a professional display of up to **24 lines of 64 lowercase characters**. Combine with graphics for 3 times the information on one screen!
- Adds **underline, subscript, superscript, reverse video, top and bottom scroll protect, double-width bold and colored lettering** with easy to use commands from within your program or **control key input** direct from keyboard. Even a built in **help screen** of commands/ status.
- Machine language extension of BASIC fully interfaced with **ALL keys, commands and PMODES** including PRINT, PRINT @, TAB and comma fields.
- **12 switchable character sizes** (most colored) of crisp, clear, true lowercase letters from 64 x 24 to 12 x 8 for VCR title screens, education, and visually impaired. An **additional 128 useful figures** of Greek, cars, tanks, planes, etc.

Includes character editor and demo program. 16K Ext BASIC required - 32K/64K supported.

see us at RAINBOWfest CHICAGO

*"Now I automatically reach for Screen Machine when I power up . . . Screen Machine is what Radio Shack should have put in the computer in the first place . . . "*

— G. Cummings - Concord, CA

Screen Machine enables YOU to do tasks which were never before possible due to limited screen capacity. Now YOU can label your hi-res pictures and graphs with ease. Now YOU can write professional programs that feature high density text and lowercase displays. Now YOU can easily create large, colored lettering for VCR title screens and educational uses. And Screen Machine is so easy to use it quickly becomes second nature.

*"(Screen Machine) is excellent. I am highly impressed with what you have accomplished . . . "*

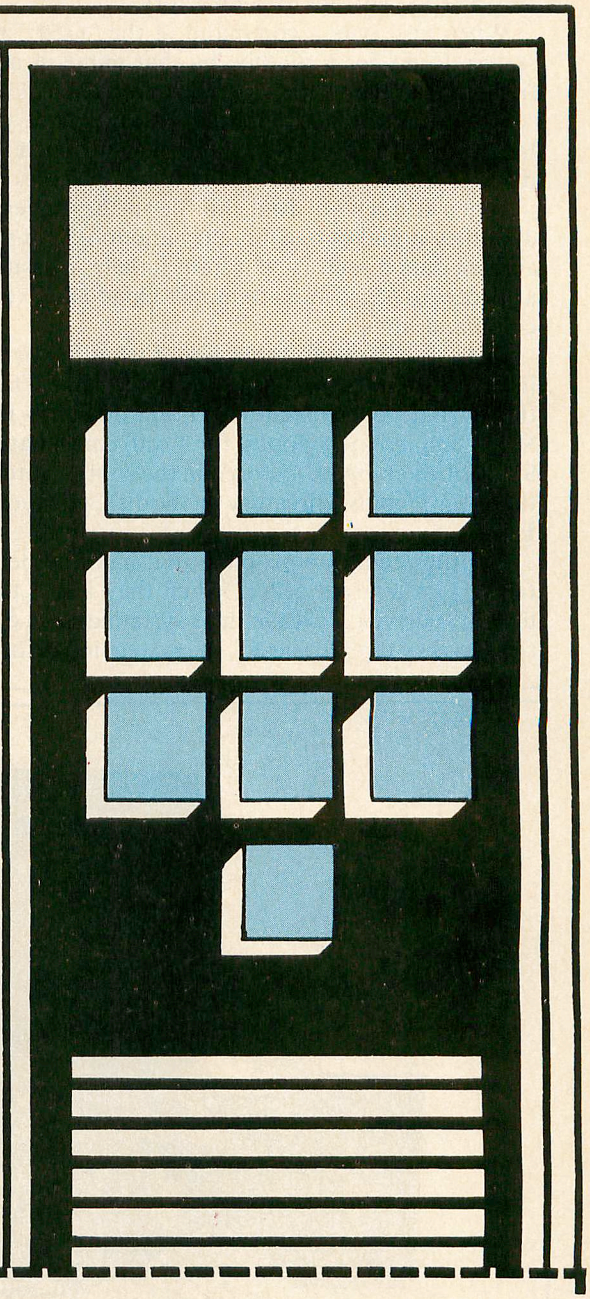
— L. Bass - Traverse City, MI

You can find dozens of uses for the additional 128 useful graphic figures built right in. And because you can modify Screen Machine's character set using the supplied character editor program you can easily customize Screen Machine to your needs. And with the free Demo program you see and learn all of Screen Machine's powerful features quickly.

*"(Screen Machine) is certainly the finest and the most frequently used program in my software library."*

— N. Cuong - N. PalmBeach, FL

# YOUR SCREEN!



## SUPER SCREEN MACHINE

$44.95 Tape
Add $3 for disk

Revolutionary — heralded as the most useful, powerful and versatile state-of-the-art utility ever developed for the Color Computer!

All the features of Screen Machine and more:

- Variable **SMOOTH Scroll, Key Click and Break Key Disable** for professional displays, listings, business use.
- **EDTASM+ Command** for instant compatibility with R.S. editor-assembler cartridge. **Superpatch+ Command** for disk users.
- **Dynamic Screen Dump Command** for use with Custom Software Engineering's Graphic Screen Print program for simple printer "Snapshots" of your screen.
- The **New Standard** — Upgradeable at any time from previous Rainbow-Writer or Screen Machine purchase. Return old program, manual, plus cost difference and $7.00 shipping and handling.

Publishers/Authors: contact the hi-res text experts for custom displays in your software.

**RAINBOW CONNECTION SOFTWARE**

**RAINBOW CONNECTION SOFTWARE**
3514 6th Place NW, Suite D
Rochester, MN 55901
507-288-4424

YES, I want to easily create dazzling displays with the best SCREEN Enhancer for my Color Computer. Please RUSH me the incredible SCREEN MACHINE at the affordable price of:

Rainbow S.M. $29.95 Tape - $32.95 Disk ______
Super S.M. $44.95 Cass - $47.95 Disk ______
Shipping $2.00
Minnesota residents add 6% Sales Tax ______
Visa & Mastercard add 3% ______
# ______ Exp ______
**TOTAL** ______

NAME ______
ADDRESS ______
CITY ______
STATE ______ ZIP ______

Personal checks welcome - no delay.
Send SASE for catalog.
Not affiliated with
THE RAINBOW

MasterCard VISA

Available in fine stores everywhere, the Dataman and Kelly Software in Canada.

getting the program to load and execute from the disk. The problem comes up when they remove the OS-9 system disk from the drive and insert the BASIC09 disk. At this point they simply type BASIC09 and usually wind up with a "Bad Path Name — #215 Error."

Let's review how OS-9 handles disk operation and the reason for the problem will become obvious. OS-9 uses two working directories at all times, the current execution directory and the current data directory.

When you type a command at the "OS9:" prompt, the system looks for a module by that name in memory. If it finds it, it executes it.

If it does not find a module with the name you typed, it looks for a file with that name in your current execution directory. If it finds it, it loads it and executes it.

When it does not find the file in the current execution directory it makes one more try and looks for the file in the current data directory. If it finds it there, it assumes that it is a "procedure file" and attempts to load and execute a list of command lines.

With this in mind, think about what happens when you insert the BASIC09 disk into your single drive. The system still thinks that your current execution directory is /d0/cmds. So, it immediately looks for "/d0/cmds/basic09". Since BASIC09, as shipped, is stored in the root directory, /d0, and there is no "cmds" directory on the disk, you receive the #215 Error.

Another common problem that has stumped many first time BASIC09 users occurs when they insert their BASIC09 disk into drive /d1, leave their system disk in drive /d0. As soon as they type "basic09", the system looks for /d0/cmds/basic09. Since it isn't there, it checks the current data directory, often /d1, and finds the file BASIC09. Since it is in the data directory, the system "knows" that it is a procedure file and attempts to execute a list of command lines. Instead it receives a bunch of binary code and you receive an error message.

The solution is to insert the BASIC09 disk into your single drive and then type the following commands:

```
OS9: chx /d0
OS9: basic09
```

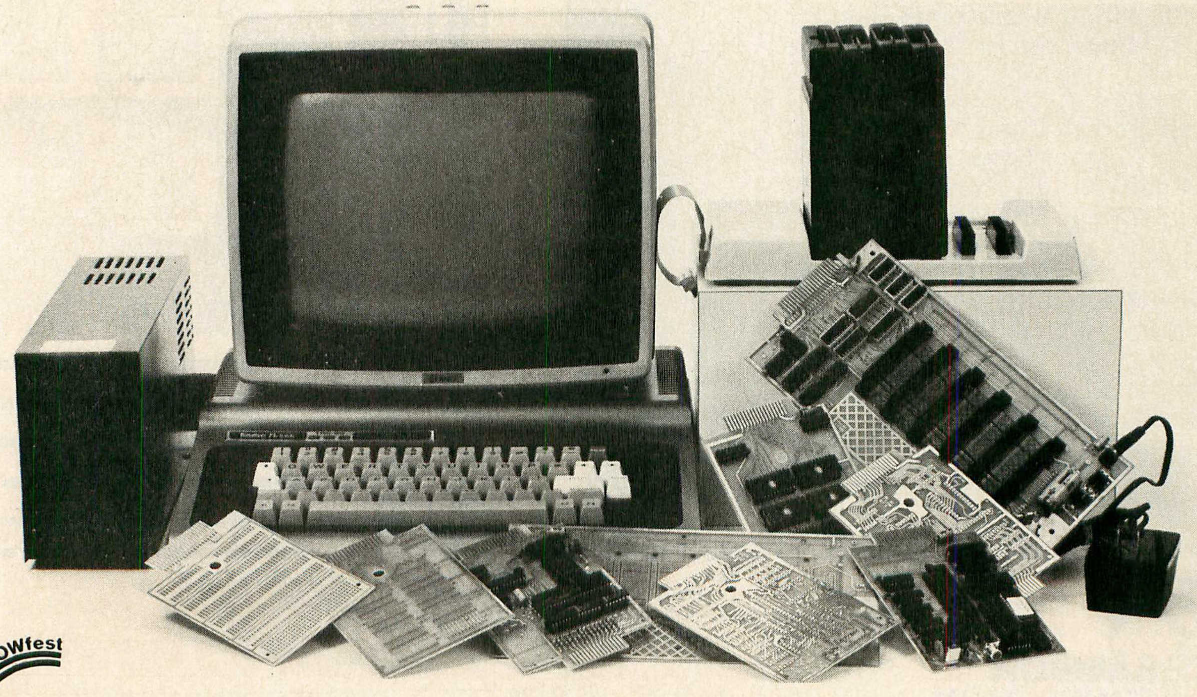
Hopefully this explanation will clear up the problems a number of people have been having with BASIC09. Remember, if you do not know which directory you are using, you can type "pwd" to find the current execution directory or "pwd" to find the current data directory. Then, if you find yourself in the wrong directory you can use "chx" to change your current execution directory or "chd" to change your current data directory.

Tom Stephens of Indianapolis, Ind., sent in a correction to a typo in the listing of Melvin Hefter's article, "One Disk is Better than Two" from the March RAINBOW. Line 60 should read:

```
60 MID$(A$,37,1)=CHR$(128)
```

Wayne Miller of Westminster, Calif., has purchased a Deluxe RS-232 cartridge from Radio Shack and is looking for a device driver and descriptor so he can use it with OS-9.

Randy Dees has written one and donated it to the OS-9 Users Group Library and has uploaded it to a database on the CompuServe OS-9 SIG. I'll contact him and see if we can



see us at RAINBOWfest CHICAGO

UNLIMITED EXPANSION

- 6 SLOT EXPANSION BUS
- PARALLEL PRINTER CARTRIDGE
- DUAL RS232 CARTRIDGE
- PROTOTYPING BOARD
- 80 COLUMN VIDEO CARTRIDGE
- REAL TIME CLOCK CARTRIDGE
- 16K RAM/ROM CARTRIDGE
- MORE TO COME

PBJ inc.
P.O. BOX 813
N. Bergen, N.J. 07047
(201) 330-1898

*WRITE OR CALL FOR OUR CATALOG*

publish it here in a future column.

Michel Beausejour of Province de Quebec, Canada writes:

"I'm really desperate, since I bought BASIC09 a couple of months ago, everything has gone wrong. Please help me.

"1) At the BASIC09 level all the procedures must be in the work space because if I don't do that, I get an Error #43. My version of BASIC09 doesn't know how to load procedures.

"2. The command *pack** always gives me an Error #214. I've tried to pack simple procedures but I always get an error message.

"3. *RunB* doesn't work at all."

BASIC09 procedures that are still in the source form (unpacked) must be in the BASIC09 work space before they can be run. BASIC09 will not load them for you automatically. It will try to find them in your current execution directory however, because it always tries to load packed procedures when it doesn't find them in memory.

There are several forms of the "pack" command.

```
B: pack
B: pack programa
B: pack programa programb >programs
B: pack*
B: pack* myprocedures
```

The first form will pack the last procedure listed or edited into your current execution directory. The next will pack the procedure named *programa* and put it in your current execution directory. The third form of the pack command will pack the procedures *programa* and *programb* and store them in a file in your current execution directory named *programs*. The next form will pack all procedures in your BASIC09 work space and store them in your current execution directory. And finally, the last form of the command will pack all procedures in the BASIC09 work space and store them in a file named "myprocedures" in your current execution directory.

There are several things you must remember about packed procedures. First, and most important, you must *SAVE* a procedure into your current data directory before you *PACK* it into your current execution directory. Once you *PACK* a procedure in the BASIC09 work space, the source code is gone forever.

Also, procedures in the source form run inside the BASIC09 work space. Once they have been *PACKed* they run outside the BASIC09 work space in the OS-9 memory area. This means that if you request too much memory for BASIC09 itself, you won't have much memory left outside the BASIC09 work space for *PACKed* procedures to run. Since packed procedures are much shorter than procedures in source form, it pays to *PACK* them.

In closing here are two items that may interest you. We received a nice letter from Paul Burega, a software consultant at 1 Pleasant Bay, Winnipeg, R2K 0C9. He has written a package that turns an Epson printer into a pseudo-typesetter. He sent his letter in several fonts and several sizes. Let him know if you think he has a viable product for CoCo OS-9.

And, Frank Hoffman at Lloyd I/O, 19535 N.E. Glisan Street, Portland, Ore., 97230, has written a native language BASIC compiler for OS-9. It supports sequential files, floating point math, three sizes of integers, string variables and arrays. We'll try to have more on this product in a future column.

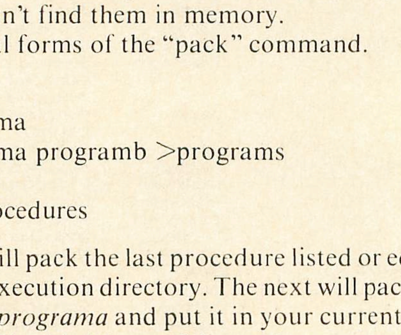
GRAFPLOT

DRAWS A PICTURE WORTH 1000 WORDS

RAINBOW CERTIFICATION SEAL

-"Very impressed."
-"Equally useful in the home and office."
-"Meticulous, handholding documentation."
-"Very easy to use."
- RAINBOW, July '83

(Actual output)
(Shown reduced)



FREE!
BUILT-IN SCREENPRINT
FOR R/S PRINTERS:
LP VII/VIII & DMP 100/200

Unconditional Money Back Guarantee

**GRAFPLOT 1.1** includes everything you need to go effortlessly from raw data to professional-quality printed graphs in minutes. Perfect for business, personal, educational, scientific and engineering applications. Free screenprint for R/S printers.

- * Automatically scales and draws graph for best appearance.
- * Full ASCII upper and lower case in 4 on-screen labels.
- * Two fully labeled Y-axes, 200 or more data points per axis.
- * 9 graphing symbols with unlimited overlay of data.
- * Full function data editing: add, change, delete and sort.
- * **Universal Screenprint Loader**- Automatically interfaces ANY screenprint program for non-Radio Shack printers.
- * Graphs and data output to screen, printer, tape or disk.
- * Plots user-defined functions: projections, regressions, etc.
- * Calculates moving averages (binomial smoothing), cumulative totals and integrals of data or user-defined functions.
- * Saves completed graphs for instant reloading.
- * Menu driven with complete error trapping and auto-prompting.
- * Comprehensive manual w/ tutorials and sample data.
- * Disk Only: display or print directory, kill or rename files.
- * Many other labor-saving and time-saving features.

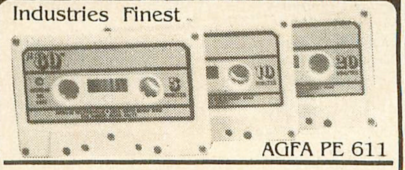
**GRAFPLOT** is available for 16K E.C.B. ($35.00) and 32K E.C.B. ($40.00) on cassette and for 32K disk ($45.00) (U.S.). Send check or money order to: **HAWKES RESEARCH SERVICES, 1442 Sixth St., Berkeley, CA, 94710.** Manual available separately for $10.00 + shipping, refundable with purchase. Include $3.00 shipping on all orders. California residents add sales tax.

******* ATTENTION DEALERS!! 60% DISCOUNTS AVAILABLE !! *******

NEVER UNDERSOLD
—Leader Since 1980—

COMPUSETTE®
at
Manufacturer Prices

Industries Finest



| | Retail | Your Cost |
|---|---|---|
| C-05 | 99¢ | 55¢ each |
| C-10 | \$1.29 | 59¢ each |
| C-20 | \$1.59 | 69¢ each |
| C-30 | \$1.89 | 89¢ each |
| Cases | 49¢ | 21¢ each |

Packed 24 Per Pack

UPS \$3.00 Per Pack 48 States

Micro-80™ INC.

VISA

2665 Busby Rural Rd.
Oak Harbor, Wash., 98277

MasterCard

IMMEDIATE SHIPPING
(206) 675-6143

# THESE FINE STORES CARRY THE RAINBOW

The retail stores listed below carry *the Rainbow* on a regular basis and may have other products of interest to Color Computer users. We suggest you patronize those in your area.

| | |
|---|---|
| **ALABAMA** | |
| Birmingham | Jefferson News Co. |
| Florence | Anderson News Co. |
| Huntsville | Endicott Software |
| Madison | Madison Books |
| Montgomery | Trade 'N' Books |
| **ALASKA** | |
| Anchorage | Radio Shack |
| Fairbanks | Electronic World |
| **ARIZONA** | |
| Glendale | Road Runner Computer Products |
| Mesa | Personal Computer Place |
| | Software Center |
| Phoenix | Home Brew Computers |
| | The Computer Shop |
| | Tri-Teck Computers |
| Scottsdale | Data Concepts |
| | Softwareland Corp. |
| Sierra Vista | Livingston Books |
| Tempe | All Systems Go |
| | Books Etc. |
| | Computer Library |
| Tucson | Anderson News Co. |
| Yuma | Soft Shop |
| **ARKANSAS** | |
| Little Rock | Anderson News Co. |
| **CALIFORNIA** | |
| Atwater | Electrobrain |
| Citrus Heights | Software Plus |
| Downey | The Floppi Disk |
| El Cajon | Radio Shack |
| Exton | Software City |
| Fortuna | R&V Sound |
| Half Moon Bay | Strawflower Electronics |
| Hesperia | Dessert Sound, Inc. |
| Hollywood | Levity Distributors |
| Livermore | Software Galeria |
| Lompoc | L&H Electronics Emporium |
| Los Angeles | OPAMP Technical Books |
| Modesto | Software Mart |
| National City | JARB Software |
| | Willy's Electronics |
| Pacific Beach | Pro Am Electronics |
| Palo Alto | Printers, Inc. |
| Sacramento | Softwaire Center |
| | Tower Magazine |
| San Diego | Computer Dimension |
| | The Computer Store |
| | Cost Plus Software |
| | Dimensional Software |
| | Disney's Electronics |
| | Radio Shack |
| San Francisco | News On 24 |
| Santa Rosa | Software 1st |
| | Sawyer's News, Inc. |
| Southgate | Color Computing |
| Stockton | Hardings Way News |
| Sunnyvale | Computer Literacy |
| Torrance | Softwaire Centre Int. |
| **COLORADO** | |
| Aurora | Aurora Newsland |
| Colorado Springs | Hathaway's Magazines |
| Denver | Wholelife Dist. |
| Westminster | Software City |
| **CONNECTICUT** | |
| Danbury | Computer Serv. of Danbury |
| Hartford | The Aetna Life Club Store |
| Monroe | Mackey's |
| Orange | Software City |
| **DELAWARE** | |
| Wilmington | Normar, Inc.—The Smoke Shop |
| **DISTRICT OF COLUMBIA** | |
| | The Program Store |
| **FLORIDA** | |
| Clearwater | Soenen & Wilmoth Books |
| Coconut Creek | Data Base |
| Davie | Software Plus More |
| Ft. Lauderdale | Mike's Electronics Distributor |
| | Software Connection |
| Jacksonville Beach | Book Town |
| Kissimmee | Radio Shack & Elec. Hut |
| Longwood | Adventure International Store |
| Melbourne | City Newsstand |
| | The Little Store |
| Miami | Micro Byte |
| | The News Rack |
| Orlando | The Alamo |
| | Software Unlimited |
| Panama City | Computer Systems Group |
| | Boyd-Ebert Corp. |
| Pensacola | Anderson News Co. |
| Sarasota | Family Computers |
| South Pasadena | Poling Place |
| Stuart | Caribbean Engineering Corp. |
| Tallahassee | Anderson News Co. |
| Tampa | Fine Print Bookstore |
| | Software Store |
| | Sound Trader & Computer Center |
| **GEORGIA** | |
| Atlanta | Chips, Inc. |
| | Guild News Agency |
| | Software City |
| Columbus | Muscogee News Co. |
| | Software City |
| Cummings | Kent Radio Shack |
| Jesup | Kannon Music |
| | Radio Shack |
| Marietta | Act One Video |
| Toccoa | Martin Music Radio Shack |
| **IDAHO** | |
| Blackfoot | F/M Systems Electronics |
| Boise | Magnum Computer Products |
| Moscow | Johnson News Agency |
| **ILLINOIS** | |
| Aurora | Kroch's & Brentano's |
| Champaign | Book Market |
| Chicago | B. Dalton Booksellers |
| | N. Walbash St. |
| | West Jackson St. |
| | Bob's in Newtown |
| | Bob's News Emporium |
| | Bob's Rogers Park |
| | Book Market |
| | East Cedar |
| | North Cicero |
| | West Diversey |
| | E.B. Garcia & Associates |
| | Guild Books & Periodicals |
| | Kroch's & Brentano's |
| | South Walbash |
| | West Jackson |
| | 516 N. Michigan |
| | 835 N. Michigan |
| | Parkway Drugs |
| | Parkwest Books |
| | Sandmeyer's Bookstore |
| | Univ. of Chicago Bookstore |
| | Univ. of Illinois Bookstore |
| | Videomat, Inc. |
| Danville | Book Market |
| DeKalb | Appletree Computers |
| Evanston | Chicago-Main News |
| Geneseo | B & J Supply |
| | J.F.E. Computers |
| Lisle | Book Nook |
| Newton | Bills TV Radio Shack |
| Oak Brook | Kroch's & Brentano's |
| Oak Park | B.I.E.S. Systems |
| | Kroch's & Brentano's |
| Peoria | Book Market |
| | Illinois News Service |
| Schaumberg | Data Domain |
| | Kroch's & Brentano's |
| Skokie | Kroch's & Brentano's |
| S. Holland | Abacus Computers |
| Wheeling | North Shore Distributors |
| Wood Dale | Pace-Micro Software Centers |
| **INDIANA** | |
| Berne | White Cottage Electronics |
| Garrett | Finn News Agency |
| Greenwood | The Computer Experience |
| Indianapolis | Bookland, Inc. |
| | Game Preserve |
| | Indiana News |
| Jasper | Computer Store |
| | Elex Mart |
| Lawrenceburg | Bauer Electronics |
| Madison | Arcs Office Supplies |
| Martinsville | Radio Shack |
| Mishawaka | Carrico's Radio Shack |
| New Haven | Advanced Color Software |
| Scottsburg | Radio Shack of Scottsburg |
| Walbash | Mitting's Electronics |
| **IOWA** | |
| Ames | Myers' TV & Stereo Repair |
| Bettendorf | Cosmos Computers |
| Davenport | Interstate Book Store |
| | Software City |
| **KANSAS** | |
| Hays | Gulliver's Inc. |
| Junction City | III H's Stereo |
| Kansas City | Special Computer Support |
| Topeka | Palmer News, Inc. |
| | Town Crier of Topeka, Inc. |
| Wichita | Amateur Radio Equipment Co. |
| | Lloyd's Radio |
| **KENTUCKY** | |
| Hopkinsville | Hobby Shop |
| Louisville | The Computer Store |
| Maysville | Radio Shack |
| Paducah | Radio Shack |
| Paintsville | Gus-Stan Enterprises |
| Pikeville | Gus-Stan Enterprises |
| **LOUISIANA** | |
| Baton Rouge | Acme Book Co. |
| Crowley | Acadiana Newsstand |
| Shreveport | Computer SOS |
| Slidell | Radio Shack 7181 |
| **MAINE** | |
| Brockton | Voyager Bookstore |
| E. Wilton | O'brian's Electronic Svc. Ctr. |
| Lewiston | Computer Software & Education Centers |
| South Portland | Portland News Co. |
| Waterboro | Radio Shack |
| **MARYLAND** | |
| Baltimore | The Program Store |
| Kensington | The Program Store |
| Lexington Park | Books, Etc. |
| | Bowes Books |
| **MASSACHUSETTS** | |
| Brockton | Vogager Bookstore |
| Cambridge | Ninis Corner, Inc. |
| | Out Of Town News |
| | The Program Store |
| Danvers | Microcon Computer & Software Store |
| Farmingham | Program Store |
| Fitchburg | Corners Book Shop |
| Ipswich | Ipswich News |
| Littleton | Computer Plus |
| Lynn | North Shore News Co. |
| Mansfield | Software Shop |
| Springfield | Software City |
| Woburn | Microcon Softwarecenters |
| **MICHIGAN** | |
| Allen Park | Book Nook, Inc. |
| Ann Arbor | Community News Center |
| | Software City |
| Brooklyn | Weatherwax Radio Shack |
| Charlotte | Computer Options |
| Dearborn | DSL Computer Products |
| Durand | Robbins Electronics |
| Fenton | Tri-County Electronics Radio Shack |
| Flint | "I O" |
| Kalamazoo | John Rollins |
| Lapeer | Computer Corner |
| | User Friendly |

| | |
|---|---|
| Lowell | Curt's Sound & Home Arcade Center |
| Mt. Morris | Shop And Save |
| Muskegon | The Eight Bit Corner |
| Novi | MI Software Dist., Inc. |
| Okemos | Software City |
| Owosso | C/C Computer Systems |
| | Hi-Fi Audio Co. |
| Perry | Perry Oil & Gas |
| Pontiac | Computer Shack |
| Roseville | New Horizons |
| Royal Oak | Software City |
| St. Johns | Clinton Electronics |
| Southfield | Software City |
| Sterling Heights | Sterling Book Center |
| Utica | Byte By Byte |
| **MINNESOTA** | |
| Minneapolis | Read-More News |
| **MISSISSIPPI** | |
| Grenada | Stereo Store of Grenada, Inc. |
| Gulfport | Computerland |
| **MISSOURI** | |
| Creve Coeur | Software City |
| Kansas City | Midwest CoCo Systems |
| St. Louis | Magic World |
| | Softwaire Centre |
| | Computer Xchange |
| University City | Final Edition |
| **MONTANA** | |
| Sydney | Tomalino's Electronics |
| **NEBRASKA** | |
| Lincoln | Hobby Town |
| Omaha | Computers & Components |
| **NEVADA** | |
| Las Vegas | Hurley Electronics |
| **NEW HAMPSHIRE** | |
| Peterborough | Radio Shack |
| Portsmouth | Portsmouth Computers |
| West Lebanon | Verham News Corp. |
| **NEW JERSEY** | |
| Bergenfield | Software City |
| Cedar Knolls | Village Computer & Software |
| Cherry Hill | Software City |
| Clinton | Micro World II |
| Eatontown | The Program Store |
| Lawrenceville | Micro Con Software Center |
| Linwood | Software City |
| Marmora | Outpost Radio Shack |
| Midland Park | Software City |
| Montvale | Software City |
| Morristown | Software City |
| Nahwah | Computer Discount of N.J. |
| Pennsville | Dave's Elect. Radio Shack |
| Pinebrook | Software City |
| River Edge | Software City |
| Rockaway | Software Station |
| Summit | Software City |
| Teaneck | Software City |
| Wayne | Wayne Software |
| **NEW MEXICO** | |
| Albuquerque | East West Enterprises |
| | Page One Newsstand |
| | Salt of the Earth |
| **NEW YORK** | |
| Brockport | Lift Bridge Book Shop, Inc. |
| E. Rochester | The Software Shop |
| East Syracuse | The Data'Phile Co. |
| Fairport | Software City |
| Great Neck | Software City |
| Hudson Falls | G.A. West & Co. |
| Johnson City | Unicorn Electronics |
| Melville | Imperial News |
| Mt. Kisco | Software City |
| New York | Barnes & Noble—Sales Annex |
| | Coliseum Books |
| | Eastern Newsstand |
| | Grand Central Station, Track 37 |
| | 200 Park Ave., (Pan Am #1) |
| | 55 Water Street |
| | World Trade Center #2 |
| | First Stop News |
| | Idle Hours Bookstore |
| | International Smoke Shop |
| | Jonil Smoke |
| | Penn Book |
| | State News |
| | Usercom Systems, Inc. |
| | Walden Books |
| | World Wide Media Services |
| N. White Plains | Software City |
| Plattsburg | Adirondack Computer Supplies |
| Rochester | Village Green |
| | World Wide News |
| Syracuse | Programs Plus |
| Woodhaven | Spectrum Projects |
| **NORTH CAROLINA** | |
| Aberdeen | King Electronics |
| | Radio Shack |
| Cary | It's Just For You, Inc. |
| Charlotte | Software City |
| | Newsstand Int'l |
| | Papers & Paperback |

| | |
|---|---|
| Havlock | Computer Concerns |
| Hickory | Papers & Paperback |
| Marion | Boomers Rhythm Center |
| Raleigh | D.J.'s Book and News |
| | Softmart |
| Winston-Salem | K & S News Stand |
| **NORTH DAKOTA** | |
| Fargo | Computer Associates |
| **OHIO** | |
| Canton | Little Professor Book Center |
| | Software Centre International |
| Cincinnati | Cinsoft |
| Cleveland | Jerry's Computer |
| Columbus | Software City |
| | The Program Store |
| Coshocton | Utopia Software |
| Dayton | Wilke News |
| Fairborn | News-Readers |
| Kent | The News Shop |
| Kenton | T.W. Hogan & Associates |
| Lakewood | Lakewood International News |
| Lima | Brunner News Agency |
| | Edu-Caterers |
| Lorain | Computer Network |
| Mansfield | PCLEAR 80 |
| Mayfield Heights | Programs Unlimited |
| | Software City |
| Miamisburg | Wilke News |
| Niles | Computer Showcase |
| Philadelphia | Little Professor Book Center |
| Rocky River | Programs Unlimited |
| Toledo | Leo's Book & Wine Shop |
| | Reitz Electronics |
| Westerville | Home Computer Store |
| **OKLAHOMA** | |
| Duncan | Computers 'N' Stuff |
| Muskogee | Radio Shack |
| Oklahoma City | Merit Micro Software |
| Stillwater | D. Data |
| Tulsa | The Computer Store |
| **OREGON** | |
| Aloha | B. Color Computer and Software |
| Medford | John's News Stand |
| Portland | 80-Plus |
| **PENNSYLVANIA** | |
| Allison Park | Software City |
| Altoona | Newborn Enterprises |
| Greensburg | The Program Store |
| Harrisburg | Harrisburg News Co. |
| Malvern | Personal Software |
| Philadelphia | City Software Center |
| | Newsy |
| Phoenixville | Stevens Radio Shack |
| Pittsburgh | All-Pro Souveniers |
| Pleasant Hills | Pitt Computer & Software |
| Plymouth Meeting | The Program Store |
| Quarryville | SGMC Radio Shack |
| Shippensburg | Rainbow Adventure |
| Tunkhannock | The Donna Comm. Co. |
| Warrington | Software—N—Stuff |
| Whitehall | Software City |
| Williamsport | Shade Tree |
| York | The Computer Center of York |
| **RHODE ISLAND** | |
| Newport | Kelly's Variety |
| Warwick | Software Connection |
| **SOUTH CAROLINA** | |
| Charleston Hts. | Softwarehaus, Inc. |
| Beaufort | Data Byte Computer Center |
| Greenville | Palmetto News Co. |
| Hilton Head | Megatron Corporation |
| Union | Fleming's Electronics |
| **TENNESSEE** | |
| Chattanooga | Anderson News Co. |
| Knoxville | Anderson News Co. |
| | First Byte Computer Co. |
| Memphis | Computer Center |
| | Software, Inc. |
| | Tobacco Corner Newsroom |
| Nashville | Campus Computer Corp. |
| | Mills Book Store |
| | Mosko's Book Store |
| Smyrna | Delker Electronics |
| **TEXAS** | |
| Austin | Austin News Agency, Inc. |
| | Capitol Microcomputers |
| Beeville | Bee Electronics |
| Conroe | Crouchet Electronics |
| Dallas | Dallas Computer Center |
| | Software Concepts |
| Elgin | The Homing Pigeon |
| Ft. Worth | Byteworks, Inc. |
| | RFI Electronics |
| | Software Terminal |
| Houston | MicroSolutions |
| | Recycle Computers |
| Paris | Software Solutions |
| San Antonio | Coles Computer Center |

| | |
|---|---|
| **UTAH** | |
| Murray | Deseret Book |
| Ogden | Computer City |
| Salt Lake City | Quality Technology |
| **VERMONT** | |
| Burlington | Software City |
| **VIRGINIA** | |
| Alexandria | Alonso Book & Periodical |
| Falls Church | The Program Store |
| Gafton | Electronics Marketing |
| Richmond | Software City |
| **WASHINGTON** | |
| Bellevue | Software City |
| Maryville | More Than Games |
| Mount Lake Terrace | Emerald Computer Services |
| Renton | Data Borne |
| Richland | C & J Electronics Computer Center |
| Seattle | Adams News Co., Inc. |
| Spokane | Bits, Bytes & Nibbles |
| Tacoma | Nybbles 'N Bytes |
| **WEST VIRGINIA** | |
| Logan | Stan's Electronics & Radio Shack |
| Parkersburg | Valley News Service |
| **WISCONSIN** | |
| Appleton | Badger Periodicals |
| Cudahy | Cudahy News & Hobby |
| Janesville | Book World |
| Milwaukee | Book Tree |
| | Booked Solid |
| | Booked Solid II |
| | Computer Software Center |
| | Harvey Schwartz Bookshop |
| | Univ. of Wisconsin Bookshop |
| Two Rivers | Digi-Tech Communications |
| **WYOMING** | |
| Casper | The Computer Store |
| **AUSTRALIA:** | |
| **SYDNEY** | |
| Kingsford | Paris Radio Electronics |
| **CANADA:** | |
| **ALBERTA** | |
| Athabasca | McLeans Ltd. |
| Barrhead | Barrhead Sound 1982 Ltd. |
| Brooks | Double "D" A.S.C. Radio Shack |
| Calgary | Imperial Computer Ltd. |
| Camrose | Radio Shack Associated Stores |
| Claresholm | Radio Shack Associated Stores |
| Coaldale | Coaldale Sight & Sound |
| Drayton Valley | Langard Electronics |
| Edmonton | CMD Micro |
| | Kelly Software Distributors |
| Edson | Radio Shack |
| Fairview | D.N.R. Furniture & TV |
| Fox Creek | Fox City Color & Sound |
| Ft. Macleod | Radio Shack |
| Grande Cache | The Stereo Hut |
| Grande Centre | The Book Nook |
| Grande Prairie | Northern Computer Service |
| Hanna | Technics TV Ltd. |
| Leduc | Radio Shack Associated Stores |
| Lloydminster | Radio Shack Associated Stores |
| Peace River | Radio Shack Associated Stores |
| Pincher Creek | Thornton & Son's |
| Red Deer | Computerworld |
| St. Paul | Tele-Logic |
| Taber | Pynewood Sight & Sound |
| Valleyview | Don's Radio Shop |
| Vermilion | Photocraft Vermilion Ltd. |
| Wetaskiwin | Radio Shack |
| **BRITISH COLUMBIA** | |
| Burnaby | Compulit |
| Ft. St. John | Ken Dawson |
| N. Vancouver | Microwest Distributors |
| Victoria | International Software |
| **MANITOBA** | |
| Winnipeg | J & J Electronics Ltd. |
| **NOVA SCOTIA** | |
| Dartmouth | Sector Software |
| Halifax | Atlantic News |
| **ONTARIO** | |
| Bowmanville | Bowmanville Audio Vision LTD |
| Etobicoke | NEPCOM |
| Hamilton | Galls Book World |
| Kincardine | Prism Software |
| Kingston | T.M. Computers |
| London | Multi-Mag |
| Ottawa | National News Co., Ltd. |
| **QUEBEC** | |
| LaSalle | Messageries de Presse Benjamin Enr. |
| Sherbrooke | Soc. De Loc |
| **SASKATCHEWAN** | |
| Regina | George Glass |
| Saskatoon | Computertime |
| **YUKON** | |
| Whitehorse | Big Byte Computer Services |
| | H & H Electronics |
| **PUERTO RICO** | |
| San Juan | Software City |

Also available at all Waldenbooks and selected B. Dalton Bookseller stores in the United States and Canada.

# ★★★★★★★★★★★★★★★★★★★★ SELECTED SOFTWARE ★★★★★★★★★★★★★★★★★★★★

## FOR THE COLOR COMPUTER

## HARDWARE DISCOUNTS:

TAKE 10% OFF THE PRICE OF TWO OR 15% OFF THE PRICE OF 5 OR MORE!

### *UPGRADE YOUR COLOR COMPUTER!*

Complete solderless kits with easy-to-follow instructions.

| | | |
|---|---|---|
| **4K-16K** | For All Boards | $19.95 |
| **4K-32K** | For All Boards | $54.95 |
| **16K-32K** | For All Boards | $39.95 |
| **64K** | For E & F Boards & Color Computer 2 | $59.95 |

**IF POSSIBLE, PLEASE SPECIFY BOARD REVISION WITH ORDER.*

Note: All ICs used in our kits are first quality 200NS Prime Chips and carry one full year warranty.

### 'REAL TALKER'

HARDWARE VOICE SYNTHESIZER
by COLORWARE

with Votrax Chip ready to plug in and talk.
Comes with software on cassette & user's manual.

CARTRIDGE **$59.95**

### VIDEO PLUS by COMPUTERWARE

This fine unit will allow you to connect your color computer to a monochrome or color video monitor. No soldering required. Comes with easy installation instructions. **$24.95**

**BOOK: Color Basic Unravelled** *by Spectral Associates* **$19.95**

## SOFTWARE DISCOUNTS

TAKE 15% OFF THE PRICE OF ONE, 20% OFF THE PRICE OF TWO OR MORE!
All programs are in 16K machine language unless noted.

### TOM MIX SOFTWARE

| | TAPE | DISK |
|---|---|---|
| * **TOUCHSTONE** (32K) Excellent Tut-Type arcade game. | $27.95 | $30.95 |
| * **BUZZARD BAIT** (32K) Just outstanding! | $27.95 | $30.95 |
| * **DONKEY KING** (32K) Just outstanding! | $26.95 | – |
| * **KATERPILLAR** Excellent graphics. | $21.95 | – |
| * **TRAP FALL** Just like Pitfalls. | $27.95 | $30.95 |
| * **PROTECTORS** (32K) Excellent graphics. | $24.95 | – |

### SPECTRAL ASSOCIATES

| | | |
|---|---|---|
| * **CUBIX** (32K) Outstanding with 16 skill levels. | $24.95 | $28.95 |
| ** **FROGGIE** (32K) The best of its type. | $24.95 | $28.95 |
| * **LUNAR-ROVER PATROL** (32K) Just outstanding. | $24.95 | $28.95 |
| **GEOGRAPHY PAC** Excellent learning tool with 4 color hi-res. maps. Extended Basic required. | $32.95 | – |
| * **LANCER** (32K) Excellent Joust-type game. | $24.95 | $28.95 |
| * **ANDROID ATTACK** Comes with 16K and 32K. 32K version will talk. | $24.95 | – |
| * **MS. GOBBLER** (32K) Outstanding with 4 different mazes and 16 skill levels. | $24.95 | $28.95 |
| * **WHIRLYBIRD RUN** Drop bombs & fire missiles to destroy enemy bases, ships & missiles over a varying terrain. | $24.95 | $28.95 |
| * **GALAX ATTAX** Protect your base by shooting alien fighter in formation. | $24.95 | – |
| * **PLANET INVASION** Excellent Defender game. | $24.95 | – |
| * **DEFENSE** Strikingly good. | $24.95 | – |
| * **SPACE WAR** You must break through the enemy fighters and the defenses of Death Star. | $24.95 | – |
| * **GHOST GOBBLER** Highly rated Pac Man-type with 16 skill levels and lots of action. | $21.95 | – |

### INTRACOLOR

| | | |
|---|---|---|
| * **CANDY CO.** (32K) Coming Soon! | | |
| ** **COLORPEDE** Just like the arcade. | $29.95 | $34.95 |
| * **ROBOTTACK** Just like the arcade. | $24.95 | $27.95 |

### THE PROGRAMMER'S GUILD

| | | |
|---|---|---|
| ** **NINJA WARRIOR** The ultimate arcade challenge. | $29.95 | – |
| ** **PACDROIDS** The most challenging Pac Man-type. | $19.95 | – |

### RAINBOW CONNECTION SOFTWARE

**RAINBOW SCREEN MACHINE**
TAPE **$29.95** Ext. Basic Required DISK **$32.95**

**SUPER SCREEN MACHINE**
TAPE **$44.95** Ext. Basic Required DISK **$47.95**

### DATA SOFT

| | TAPE | DISK |
|---|---|---|
| ** **POOYAN** (32K) Glide up & down in your tram car while shooting arrows at vicious, hungry wolves jumping down the valley with air filled balloons. Tape & disk included. | $29.95 | $29.95 |
| * **ZAXXON** (32K) Maneuver your ship through a battlefield of state-of-the-art missiles, anti-aircraft tanks and enemy planes. Survive all that and you'll meet the deadly ZAXXON Robot! | $39.95 | $39.95 |
| ** **MOON SHUTTLE** Pilot your moon shuttle through outerspace avoiding man-o-wars, meteors, bomb launchers and expandos to meet the prince of darkness. But watch out for his darkest side. | $29.95 | $29.95 |

### COMPUTERWARE

| | | |
|---|---|---|
| * **JUNIOR'S REVENGE** (32K) Climb vines avoid obstacles & creatures to save your Father from Luigi. | $28.95 | $31.95 |
| * **GRAN PRIX** (32K) Race against the clock and challenge the Mario Andretti in your soul. | $21.95 | $24.95 |
| * **DOODLE BUG** Just like Ladybug. | $26.95 | 29.95 |

### ELITE SOFTWARE

| | | |
|---|---|---|
| * **ZAKSUND** (32K) Fly your spaceship through enemy star bases. Avoid guided missiles, lasers and firing turrets. Can you reach their leader? | $26.95 | – |

### ANTECO SOFTWARE

ROMPAK ONLY

| | |
|---|---|
| * **8-BALL** For the pool-table lover. | $29.95 |
| * **GHOST GOBBLER** by Spectral Associates | $26.95 |
| * **WHIRLYBIRD RUN** by Spectral Associates | $26.95 |

### ADVENTURE INTERNATIONAL

| | | |
|---|---|---|
| **SAIGON: THE FINAL DAYS** The most truly unique adventure ever. | $24.95 | – |
| **ADVENTURELAND** Wander through an enchanted realm and try to recover the 13 lost treasures. | $19.95 | – |
| **EARTHQUAKE** You will fear for more than your own life. | $24.95 | – |
| ** **TRIAD** (32K) Excellent new type arcade game. | $34.95 | – |
| ** **SEA DRAGON** (32K) Outstanding underwater thrills and chills. | $34.95 | – |

### SUGAR SOFTWARE

| | | |
|---|---|---|
| **TIMS** Excellent personal database management system. Extended Basic Required. | $24.95 | – |

*Please note: Software and hardware cannot be mixed for discount.*
*Requires Joystick **Joystick Optional

***WE PAY POSTAGE*** on all orders in the United States & Canada. Overseas please add $3.00. (MN Res. add 6% sales tax.)
We accept Visa, Mastercard, check or money order. U.S. funds only for foreign orders. C.O.D. please add $2.00

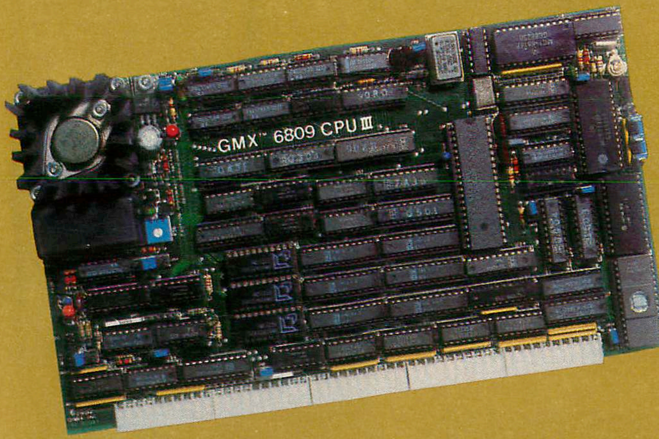
Send to: SELECTED SOFTWARE, P.O. Box 32228, Fridley, MN 55432

# *ADVERTISER'S INDEX*

**We encourage you to patronize our advertisers — all of whom support the TRS-80 Color and TDP System-100 computers. We will appreciate your mentioning the RAINBOW when you contact these firms.**

| | |
|---|---|
| A & P Software | 25 |
| Aardvark 80 | 113 |
| Abacus Computers | 95 |
| AMDT-STARDANCERS, INC. | 40 |
| Analog Micro Systems | 85 |
| Arizona Discount Software | 242 |
| Ark Royal Games | 255 |
| Armadillo International Software | 257 |
| Aurora Computing | 142, 232 |
| B & B Software | 24 |
| B5 Software | 93 |
| Basic Technology | 241 |
| Botek Instruments | 50 |
| Brown Electronics | 16 |
| Bye George | 250 |
| C & C Engineering | 272 |
| Calc-Soft | 176 |
| Carnival House | 214 |
| Cer-Comp | 111 |
| Challenger Software | 220 |
| Chroma Systems | 109 |
| Circling Star Software | 84 |
| Classical Computing | 226 |
| CMD Micro Computer Services LTD. | 66 |
| CoCo Warehouse | 177 |
| CoCo INDX | 10 |
| Cognitec | 15 |
| Color Connection Software | 184 |
| Color Micro Journal | 251 |
| Color Power Unlimited, Inc. | 9 |
| Color Software Services | 140 |
| Colorware | 186, 187 |
| Compukit | 108 |
| Computer Accessories of Arizona | 165 |
| Computer Island | 29 |
| Computer Plus | 3, 73 |
| Computer Systems Center | 170 |
| Computerware | 62, 63, 180, 235 |
| Computize, Inc. | 273 |
| Cosmos Computer Services, Inc. | 125 |
| Counterpoint Software, Inc. | 8 |
| Creative Technical | 101 |
| Custom Software Engineering | 163 |
| Data-Comp | 77 |
| Dataman | 150, 151 |
| Dayton Associates Of W.R. Hall, Inc. | 208 |
| Deft Systems, Inc. | 55 |
| Delker Electronics | 68 |
| Dennison Computer Supplies | IBC |
| Derringer Software | 20, 32, 126, 230 |
| DISK-HAVEN PRODUCTS | 225 |
| Dorsett | 76 |
| Double Density Software | 11, 188 |
| Dragon User | 248 |
| DSL Computer Products | 169 |
| Dugger's Growing Systems | 290 |
| E.D.C. INDUSTRIES | 52 |
| EAP Co. | 86 |
| Eaton Computer Products | 271 |
| Elite Software | 103, 105, 107 |
| Emerald Computer Service | 166 |
| Endicott Software | 259 |
| Eng Systems Laboratories | 36, 264 |
| B. Erickson | 79 |
| EVS | 12 |
| Federal Hill Software | 135, 137 |
| futurehouse | 148 |
| GIMIX | 306 |
| Great Plains Computer Company, Inc. | 205 |
| Green Mountain Micro | 245 |
| Hawkes Research Services | 301 |
| HJL | 229 |
| Frank Hogg Laboratory | 289, 295, 297 |
| Howard Medical | 34 |
| Incentive Software | 122 |
| Infotools | 247 |
| Intracolor | 254 |
| J & M | 238 |
| JARB Software | 98, 145 |
| The JBM Group, Inc. | 268 |
| Kelly Software Distributors | 244 |
| Key Color Software | 239 |
| KRT Software | 258 |
| Lloyd I/O | 285 |
| Macrotron Systems, Inc. | 223 |
| Magnum Distributors, Inc. | 263 |
| Majestic Software | 264 |
| Mark Data Products | 17, 18, 192, 199 |
| Marymac Industries | 219 |
| Merrick & Co. | 228 |
| Metric Industries | 284 |
| Metro Electronics | 233 |
| MichTron | 33, 35 |
| Micro-80 | 261, 301 |
| Micro Magic | 190 |
| Micro R.G.S., Inc. | 292 |
| The Micro Works | 274 |
| Microcom Software | 30 |
| Microware Systems Corporation | 44, 281 |
| Tom Mix Software | IFC, 117, 118, 119, 120 |
| Moreton Bay | 237 |
| Nelson Software Systems | 45, 46, 47 |
| Oelrich Publications | 260 |
| The Other Guys Software | 256 |
| Owl's Nest Software | 266 |
| P.B.H. | 81 |
| Pal Creations | 262 |
| Parallel Systems | 61 |
| Parsons Software | 127 |
| PBJ, Inc. | 31, 300 |
| Perry ComputerS | 167 |
| Petrocci Freelance Associates | 215 |
| Dr. Preble's Programs | 201 |
| Prickly-Pear Software | 88, 178 |
| PXE Computing | 41 |
| Pyramid Distributors | 191 |
| QCS (Quality Christian Software) | 87 |
| Radio Shack | 202, 203 |
| Rainbow Connection Software | 221, 298, 299 |
| RAINBOW Gift Certificate | 231 |
| RAINBOW ON TAPE | 134 |
| RAINBOWfest | 146, 147 |
| Reitz Electronics | 218 |
| REM Industries | 240 |
| Robotic MicroSystems | 243 |
| S & S Arcade | 267 |
| Saguaro Software | 133 |
| Saturn Electronics | 286 |
| Selected Software | 304 |
| Shamrock Software | 265 |
| Six-Pack Ribbons | 13 |
| Skyline Marketing | 216, 217 |
| The Soft Shop | 236 |
| SOFTECH | 258 |
| Softlaw Corporation | 45, 46, 47 |
| Software Connection | 177 |
| Software Plus | 234 |
| Software Support, Inc. | 82, 83 |
| Southern Software Systems | 143 |
| Spectral Associates | BC |
| Spectrum Projects | 153, 154, 155, 157, 158, 159, 161 |
| Speech Systems | 70, 71 |
| Star-Kits | 172 |
| Sugar Software | 252, 253 |
| Syntactics | 97 |
| T & D Software | 227 |
| T & S Software | 228 |
| Tandy Corporation/Radio Shack | 61 |
| TCE Programs, Inc. | 59 |
| Teague Engineering | 230 |
| ThunderVision | 270 |
| Trillium | 39 |
| True Data Products | 37 |
| Vidtron | 42, 43 |
| Wasatchware | 240 |
| The West Bay Company | 249 |
| Woodstown Electronics | 124 |
| Workbase Data Systems | 130 |
| York-10 | 291 |

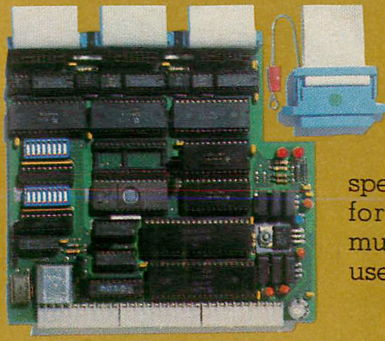
# GIMIX STATE OF THE ART 6809 SYSTEMS FOR THE SERIOUS USER.



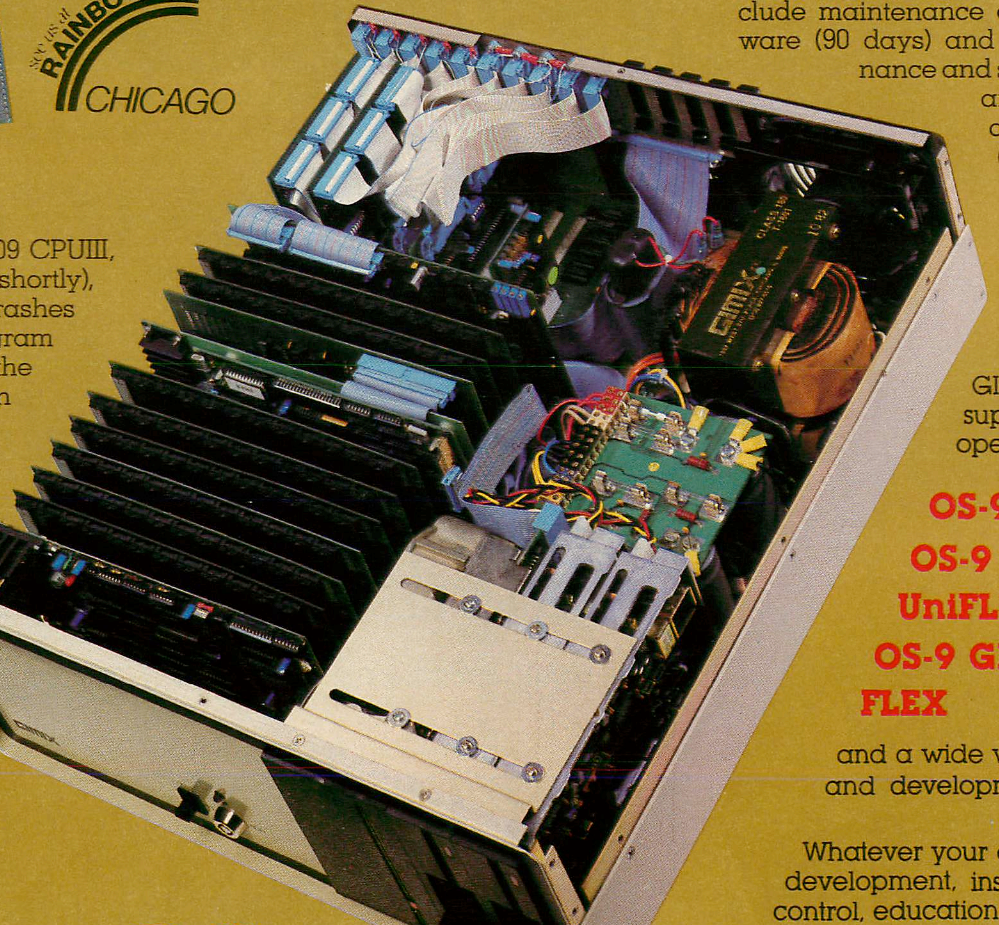
**GIMIX has 19MB or high performance 47MB Winchester Drive Systems and/or Floppy Disk Drive Systems.**

See us at
RAINBOWfest
CHICAGO

For the ultimate in performance, the Unique GMX 6809 CPUIII, using either OS-9-GMXIII or UniFLEX GMXIII (available shortly), gives protection to the system and other users from crashes caused by defective user programs. e.g. During program development, a programmer who crashes goes back to the shell or the debugger, while the other users are not even aware anything occurred.



The intelligent serial I/O processor boards significantly reduce system overhead by handling routine I/O functions, thereby freeing up the host CPU for running user programs. This speeds up system performance and allows multiple terminals to be used at 19.2K baud.



For the user who appreciates the need for a bus structured system using STATIC RAM and powered by a ferro resonant constant voltage transformer.

GIMIX has single user systems that can run both FLEX and OS-9 or Multi user systems for use with UniFLEX or OS-9.

GIMIX versions of OS9 and UniFLEX include maintenance and support by Microware (90 days) and TSC (1 year). Maintenance and support after this period are available at extra cost.

(NOTE: this support and maintenance is only for use with approved GIMIX hardware)

GIMIX 6809 systems support five predominant operating systems:

**OS-9 GMX III,**
**OS-9 GMX II,**
**UniFLEX,**
**OS-9 GMX I,**
**FLEX**

and a wide variety of languages and development software.

Whatever your application: software development, instrumentation, process control, educational, scientific or business; whether you need single or multi-user capabilities, GIMIX has hardware and the operating systems to get the job done reliably.

Please phone or write if you need further information.

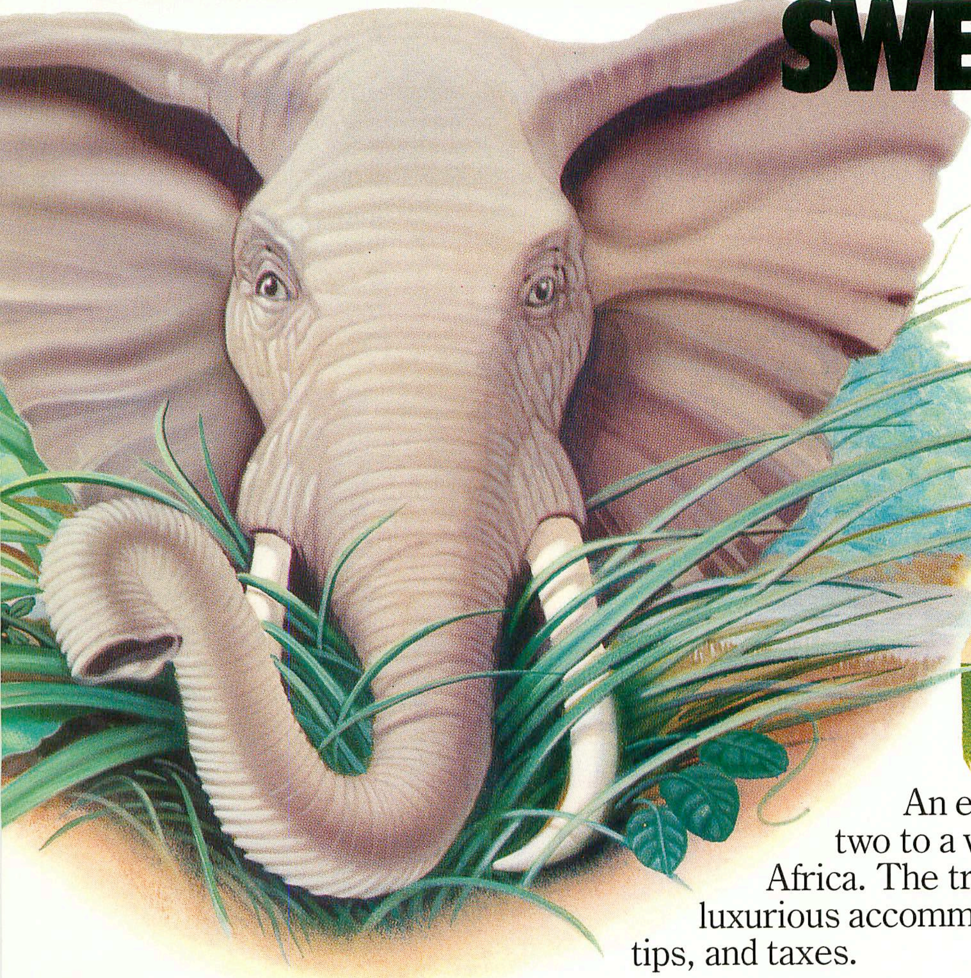
BASIC-09 and OS-9 are trademarks of Microware Systems Corp. and MOTOROLA, Inc.
FLEX and UniFLEX are trademarks of Technical Systems Consultants, Inc.
GIMIX, GHOST, GMX, CLASSY CHASSIS, are trademarks of GIMIX, Inc.

GIMIX INC.

1337 WEST 37th PLACE • CHICAGO, ILLINOIS 60609 • (312) 927-5510 • TWX 910-221-4055

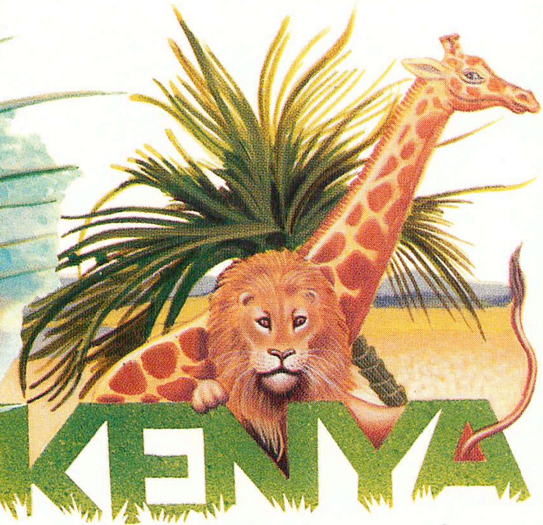
© 1983 GIMIX Inc.

# ENTER THE ELEPHANT™ SAFARI SWEEPSTAKES.

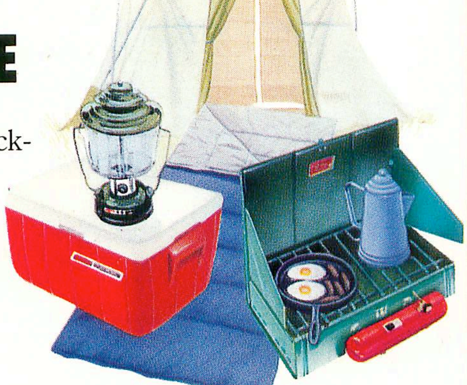


## GRAND PRIZE

*(1 winner)*



An exciting two week adventure for two to a wild game preserve in Kenya, Africa. The trip includes airfare, luxurious accommodations, meals, tips, and taxes.



## FIRST PRIZE

*(5 winners)*

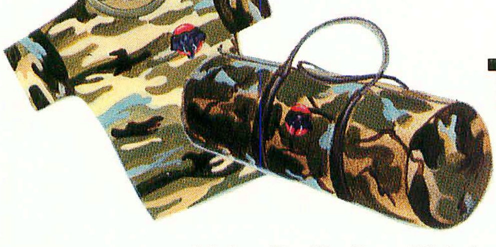
A Deluxe Camping Package featuring an 8′ x 10′ Wenzel Cabin Tent, four Wenzel sleeping bags, plus a Coleman lantern, stove and cooler.

BELL&HOWELL

## SECOND PRIZE

*(25 winners)*

A Bell & Howell 35mm camera. The 35J complete with fine Lumina lens completely eliminates complicated focusing.



## THIRD PRIZE

*(100 winners)*

Camouflage Nylon Duffle Bag. This handsome bag is water repellent and double reinforced at all stress points.

*And thousands of Elephant Safari camouflage T-shirts featuring the Elephant logo.*

## HOW TO ENTER

No purchase necessary. Just come into a participating Elephant Safari Sweepstakes dealership where you'll find free entry blanks and official rules. While you're there, check out our full line of quality Elephant memory disks and accompanying products. Entries must be received by July 31, 1984. Void where prohibited.

**Dennison**

For the Elephant dealer nearest you, call 1-800-343-8413. In Massachusetts, call collect 617-769-8150.

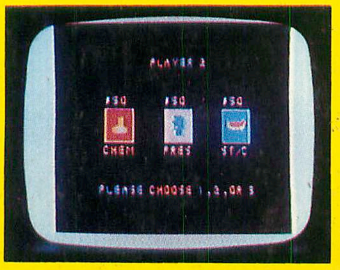
ELEPHANT MEMORY SYSTEMS

**ELEPHANT NEVER FORGETS™**

# SPECTRAL ASSOCIATES

3416 S. 90th
Tacoma, WA 98409

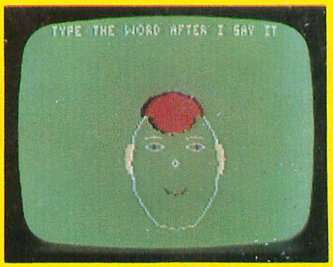
**QUIZSPIN**
An educational game similar to T.V.'s "Joker's Wild". Five categories to choose from. QUIZSPIN uses the highest resolution graphics.
$24.95 CASS
$28.95 DISK

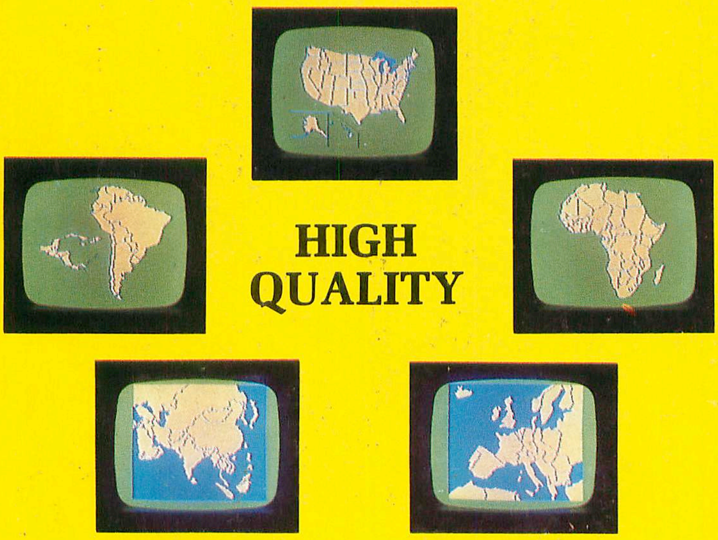


The name of the game is

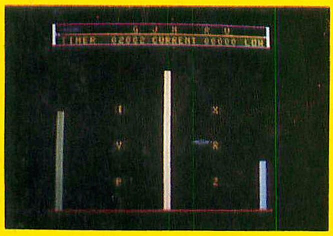
## EDUCATION!!

**SPELLING MASTER**
Conquer Spelling! A word list is provided or an unlimited number of words can be used
16K Extended BASIC
$17.95 CASS





**HIGH QUALITY**



**ALPHA SEARCH**
Guide your ship up and down elevators trying to capture all of the letters of the alphabet.
$14.95 CASS
$18.95 DISK

## GEOGRAPHY PAC

A collection of five programs with maps of the USA, Asia, Europe, Africa and South/Central America. Answer sheet included. Also available as single games.
Requires 16K RAM and Extended BASIC
$32.95 CASS
$36.95 DISK

## Learning...

**TYPE ASSAULT**
An arcade quality typing game. Nine skill levels. Your score increases as does your typing skill.
16K RAM and Extended BASIC
$24.95 CASS
$28.95 DISK

made fun and easy by Spectral Associates

NEW

Call or write for catalog.
Business office:
3418 S. 90th
Tacoma, WA 98409
PH: (206)581-6938

We accept VISA, Mastercard
Add 3% for shipping
2.00 minimum
No C.O.D. orders

NEW